



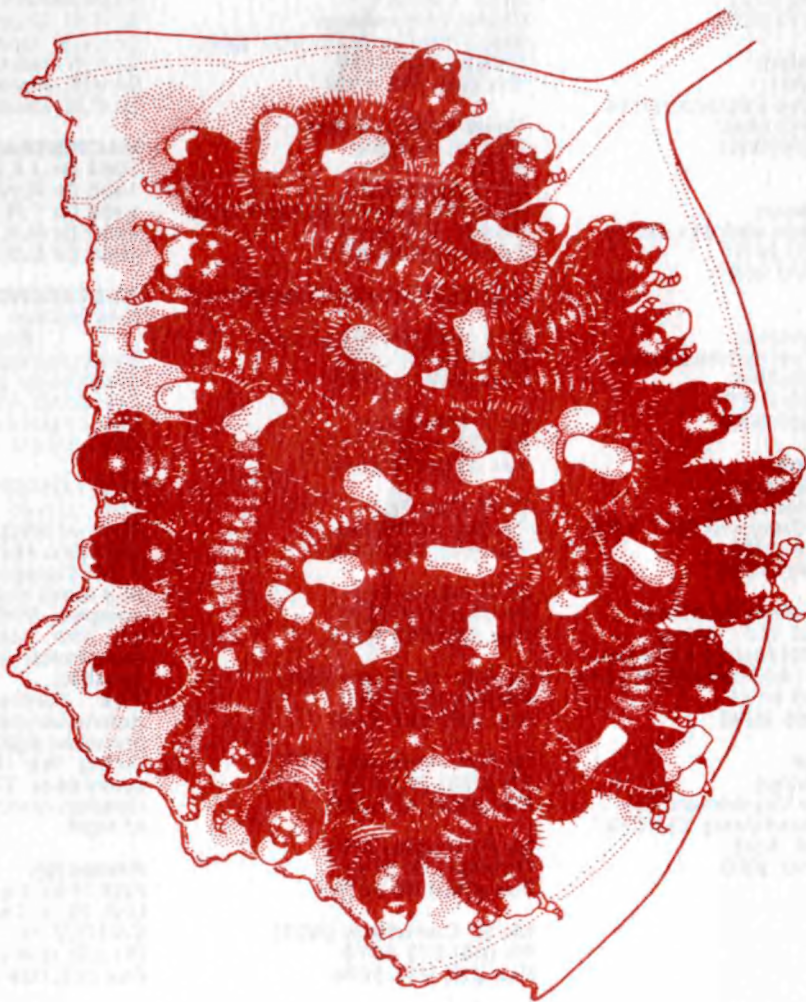
MYRMECIA



News Bulletin of the Australian Entomological Society Inc.

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ENTOMOLOGICAL SOCIETY
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Dr C.N. Smithers

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1984 Dr J.A.L. Watson
1986 Dr R.W. Sutherst
1988 Dr T.R. New
1990 Dr R.A.I. Drew
1992 Dr E.S. Nielsen

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Bayer Australia Ltd
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THE COVER

The cover for this year's
Myrmecia features an illustration
by Karina Hansen McInnes from a
photograph by Penny Gullan
of a larval mass of *Perga affinis*
complex (HYM: Pergidae), one
of the common species
complexes in the Australian
sawflies.

The formation of these
defensive rosettes, which are a
common sight on eucalypt trees
during the day, is known as
cycloaexy. The larvae form the
rosettes during the day and feed
at night.

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ADVERTISING RATES FOR MYRMECIA

	Single Issue	4 Issues (One year)
Full Page	\$60	\$180
Half Page	\$35	\$105
Quarter Page	\$24	\$72

These rates apply to camera-ready copy supplied by the advertiser. Where this is not supplied, an additional charge may be made for the layout.

In addition, loose inserts and pamphlets supplied by the advertiser will be included in a mailout for \$100 per item. The items should be of a size which will not project beyond the pages of *Myrmecia*.

NOTICE

Statements made in *Myrmecia* do not necessarily represent the views of the Australian Entomological Society. Items printed herein should not be reproduced without permission of the author of the material.

COPY DEADLINE FOR NEXT ISSUE

Material for publication in the August 1994 issue of *Myrmecia* should be in the hands of the Editor at the address below by **Friday 22 July 1994**. Submission can be made to the editor via email to **fletchm@agric.nsw.gov.au** or on IBM-compatible floppy disk in a major word processing format is preferred. Details are available from the Editor.

Murray FLETCHER

News Bulletin Editor

Biological and Chemical Research Institute
PMB 10, Rydalmere, NSW 2116

EXECUTIVE REPORT

Meetings

The Core Executive met on 17 February and 17 March 1994

New Members

We welcome the following new members to 1994 membership:

Elected 17 February 1994

Ms V.J. BARRETT, BSc, CSIRO Division of Entomology, PMB 2, Glen Osmond SA 5064. Vicki is a Technical Officer engaged in the study of earthworms in agriculture and in the biological control of snails.

Mr J. GREEN, BSc(Hons), CRC for Tropical Pest Management, University of Queensland 4072. Jan is a PhD scholar engaged in the project: Ecological role of spiders in a citrus agro-ecosystem.

Elected 17 March 1994

Mr A. DAHLAN, MSc, Dept of Entomology, University of Queensland 4072. Ahmad is a full-time PhD Student in the above Dept and is involved in studies of artificial media for *Trichogramma* spp.

Mr D.S. GIBSON, Dip Appl Sc (Agr), 45 Rice St,

Rockhampton QLD 4701. Dean is a Senior Technician with CSIRO and has been collecting *Culicoides* spp. for taxonomic studies for 20 years.

Mr M.D. GOLAM NABI AZAM, Orange Agricultural College, PO Box 883, Orange NSW 2800. Mr Azam is enrolled in a Master of Rural Management course and is engaged in studies of fruit protection using a vegetable-oil based adjuvant.

Mr D. HOWPAGE, M.Pest.Man., Faculty of Horticulture, University of Western Sydney (Hawkesbury), Richmond NSW 2753. Daya is a full-time PhD Student with interests in honey-bee biology and pollination and is involved in studies of honey-bee mandibular pheromones.

Mr M. IQBAL, Dept of Crop Protection, Waite Campus, University of Adelaide, Glen Osmond SA 5064. Mr Iqbal is involved in studies of hymenopteran systematics.

Mr S.K. ROBSON, BSc(Hons), Dept of Biology, Boston University, 5 Cummings St, Boston MA 02215 USA. Simon is a full-time PhD Student and Tutorial Fellow with an interest in the social insects.

Mr D. SLANEY, Dept of Zoology, James Cook University, Townsville QLD 4811. David is a PhD Student in entomology.

Miss V. TRAKEVESKI, Dept of Zoology, La Trobe University, Bundoora VIC 3083. Date of election altered to 1 January 1994.

Resignation from Membership

(Received with regret)

Dr P.E. COOMBE

Dr K. GIBB

Dr K.E. LEE

Dr A. MACQUEEN

Dr H. MARIATH

Mr A. PATSIAS

Dr P.H. SMITH

Mr P.D. WEBB

Change of Address or Title (Meeting in February)

Miss M.P. ABLIN is now Mrs M.P. VITELLI

Mr G.J. BAKER, Primary Industries (SA), GPO Box 1671, Adelaide SA 5001

Ms R. BROE, *Myrmecia* subscription cancelled

Dr B.K. CANTRELL, Divn Plant Protection, Dept Plant Industries, 80 Meiers Rd, Indooroopilly QLD 4068

Ms G.F. CARRUTHERS, Commonwealth

Environmental Protection Agency, PO Box 305, Queen Victoria Terrace, Parkes ACT 2600

Ms D. CHIN, Entomology Branch, Dept of Primary Industries & Fisheries, PO Box 79, Berrimah NT 0828

Ms F.J. CLISSOLD, c/o Dept of Ecology and Evol. Biology, Monash University, Clayton VIC 3168

Mr R.D. COOPER, Army Malaria Research Unit, Liverpool Military Area, NSW 2174

Dr L.J. COOKSON, CSIRO Ian Wark Laboratories, Private Bag 10, Rosebank MDC VIC 3169

Miss M. CASTILLO PANDO, from Student to Full Member; new address is 11/10 Bank St, Meadowbank NSW 2114

CYANAMID AUSTRALIA PTY LTD, contact is Mr S. Jones, 5 Gibbon Rd, Baulkham Hills NSW 2153

Mr I.G. FAITHFUL is now a full-time Student

Mr S.P. FRANCES, Army Malaria Research Unit, Liverpool Military Area, NSW 2174

Mr C.G. FREEBAIRN, c/o MHRS, PO Box 5083, Nambour QLD 4560

Mr M. GIBIAN, 55 Jalan Lim Tai See, No. 01-05, SINGAPORE 1026

Mr H.G. GREENING has returned to financial, retired-member status

Dr P.J. GULLAN, Divn of Botany & Zoology, Australian National University, Canberra ACT 0200

Dr P.A. HOLDSWORTH, c/o National Registration Auth, PO Box 240, Queen Victoria Tce, Parkes ACT 2600

Dr B.A. JENKINS, Dept of Ecosystem Management, University of New England, Armidale NSW 2351

Mrs C. MARES, Cotton Research Unit, PO Box 59, Narrabri NSW 2390

Dr S.W. McKECHNIE has returned to financial, full-member status

Mr R.P. McMILLAN, temporary address until June 1994 is PO Denmark WA 6333

Mr J.A. OSMELAK, Inst for Horticultural Development, Private Bag 15, South-Eastern Mail Centre VIC 3176

Mr F.D. PAGE, Divn of Plant Protection, DPI, Stanthorpe QLD 4380

Ms N. PELEA, Bicol University, College of Fisheries, Tabaco, Albay PHILIPPINES 4511

Mr B.A. PYKE, PO Box 540, Narrabri NSW 2390

Mr T.G. QUINLAN, 70 Shakespeare St, Mt Hawthorn WA 6016

Dr J.L. READSHAW has returned to financial, full-

member status

Mr G.P. SHELDON, Flat 8, 41 Morang Rd,
Hawthorn VIC 3122

SHELL CHEMICAL (AUST), delete as Sustaining
Associate

Mr Z.C. SHENG has returned to financial, full-
member status

Mr N.S. SHERWOOD has returned to financial,
full-member status

Ms J. STAPLES, has returned to financial, full-
member status

Miss H. WALLACE, c/o DPI, MS 108, Ashfield Rd,
Bundaberg QLD 4670

Change of Address or Title (Meeting in March)

Mr J.H. ARDLEY, status change to Retired

Mrs L.A. BALLANTYNE, status change to Dr

Dr M. BENGSTON, Agricultural Production Group,
Dept of Primary Industries, Meiers Rd,
Indooroopilly QLD 4068

Mr G.N. BERG, Plant Sciences & Biotechnology,
Dept of Agriculture, La Trobe University,
Bundoora VIC 3083

Ms L.G. COOK, 24 Goldfinch Cte, Theodore ACT
2905

Dr M.T. COOMBS, status change to Dr, address
change to CSIRO Entomology, PMB 3, Meiers
Rd, Indooroopilly QLD 4068

Dr R.P. FIELD, 51 Sandells Rd, Tecoma VIC 3160

Mr J.H. HAWKING, has postgraduate degree of
MSc

Dr C.J. HILL, Dept of Public Health & Tropical
Medicine, James Cook University, Townsville
QLD 4811

Dr C.E. HOELSCHER, BCRI, NSW Agriculture,
PMB 10, Rydalmere NSW 2116

Prof H.F. HOWDEN, 23 Trillium Ave, Nepean,
Ontario K2E 5M8 CANADA

Dr J. JACKSON, 38A Bath St. Battery Point TAS
7004

Mr R.J. KOHOUT, status change to Retired

Dr U.R. MARTINS, Museu de Zoologia, Universita
de Sao Paulo, CP 7172, 01064-970, Sao Paulo
BRAZIL

Dr J. RHEINHEIMER, Merziger Str. 24, 67063
Ludwigshafen WEST GERMANY

Dr A.M. RICHARDS, status change to Retired,
address change to 120 Coleherne Court, Old
Brompton Rd, London SW5 0GF ENGLAND

Mr G.P. SHELDON, 8/41 Morang Rd, Hawthorn
VIC 3122

Mr G.B. SMITH, BG Animal Health, Bayer

Australia Ltd, PO Box 903, Pymble NSW 2073
Mr D.R. SPARKS, Dunsandle Station, Bourke
NSW 2840

Dr R.E. TEAKLE, CRC for Tropical Pest
Management, Divn of Plant Protection, Dept of
Primary Industries, Meiers Rd, Indooroopilly QLD
4068

Ms T. WHARTON, 42 Pitt St, North Hobart TAS
7000

Mr D.G. WILLIAMS, 61 Hamilton St, Kilmore VIC
3764

Dr P. WILLIAMS, State Chemistry Laboratory, 5
Macarthur St, East Melbourne VIC 3002

Dr E.C. ZIMMERMAN, 9 Nolan Dr, Tura Beach
NSW 2548

From the Minutes**Vale**

The Executive recorded with regret the passing
of Dr M.M.H. (Murray) Wallace, Dr J.A.L. (Tony)
Watson and noted non-member Dr N.B. Tindale.

Robin Gunning, Royce Holtkamp and John
Hosking have agreed to co-convene the 26th AGM
and Scientific Conference in Tamworth, NSW, in
late 1995. They are looking to co-opt other
entomologists in the region onto the Organising
Committee. Details of the Organising Committee
and the date and venue will be provided in the
near future.

The revision and expansion of the Society's
directory of entomology to include entomologists in
South-Pacific countries is well under way. The
Executive thanks Dr Doug Waterhouse for his
interest in providing key contacts in South-West
Pacific countries.

The amended Constitution and By-Laws of the
Society have been printed and copies will be
forwarded to financial members shortly.

The Executive have sent letters to existing and
potential Sustaining Associates to explain the
benefits of supporting the Society and to
encourage their sponsorship. Any suggestions of
potential Sustaining Associates from members
would contribute to the success of increasing our
sponsorship - we will do the legwork!

Operations of the Executive are being
streamlined with new ways to prepare subscription
notices. Members who are two years in arrears
with subscriptions are being 'gently' reminded of
their outstanding debts - the response has been
good.

The Executive is still being 'cautious' financially

and looks forward to improving Society activities by capitalising on the benefits of the increased subscriptions. This year the values of the Research Grants and the cash components of the Phil Carne Prize and Insect Illustration Competition have been increased. The Society will be making a contribution to the A.J. Nicholson Centenary Meeting in recognition of a noted foundation member of the Society and eminent entomologist and ecologist.

The Executive is still pursuing ways to promote entomology to the public. Consideration is being given to increasing the promotion and number of Society publications and to establish an 'entomological award' for secondary-school students in the different States and Territories. We are seeking to develop a position, Promotions Officer, to initiate and facilitate promotional activities in the Society. Interest from any entrepreneurial members would be welcomed.

Paul MADGE
Hon. Secretary

THE AUSTRALIAN ENTOMOLOGICAL SOCIETY INCORPORATED

NOTICE OF 25TH ANNUAL GENERAL MEETING

The Society's 25th Annual General Meeting will be held in Adelaide on 26 September 1994. A Provisional Agenda list appears on page 6. Members who wish to have additional items included in the Agenda for discussion at the 25th AGM need to provide the Secretary with details by 15 August 1994.

CALL FOR NOMINATION OF OFFICE BEARERS AND COUNCILLORS

The following Offices will fall vacant at the Society's 25th Annual General Meeting on 26 September 1994. Nominations for election should be made on the form opposite and should reach the Secretary no later than 15 August 1994.

Vacant Office
President
Vice-President
Secretary
Treasurer
Public Officer
Chief Editor
Business Manager
News Bulletin Editor
Technical Editors

Present Incumbent
⊗ Dr G H S Hooper
✦ Dr P G Allen
✦ Dr P E Madge
✦ Mr J T Jennings
✦ Dr I D Naumann
✦ Dr P G Allsopp
✦ Dr G M Clarke
✦ Dr M J Fletcher
✦ Dr A N Andersen
✦ Dr A L Bishop
✦ Dr I D Naumann
Dr A Wapshire

Please Note:

The President is elected annually for a maximum of two years. As Dr Hooper has completed two years, he is not eligible for re-election. The other Officers, except Drs Andersen and Wapshire, were elected for a term of two years at the 23rd AGM in Hobart and are eligible for re-nomination for another two-year term. Dr Wapshire has one year remaining of his two-year term and Dr Andersen needs to be nominated for a two-year term.

Regional Councillors

Queensland Dr H A C Fay
✦ Mr G B Simpson
✦ Dr T A Heard
New South Wales . . . ⊗ Mr R J Faulder
✦ Ms L Rodgerson
⊗ Mr J G Clancy
Victoria ✦ Mr A Henderson
⊗ Dr A Yen
ACT ✦ Dr D Dall
✦ Dr P S Cranston
South Australia . . . ✦ Mr W E Frost
New Councillor (Clause 29)
Tasmania ✦ Mr R Bashford
Western Australia . . ✦ Dr D F Cook
Northern Territory . . ✦ Mr C G Wilson

Representative Councillors

Ent. Soc. of Qld . . . ⊗ Dr J King
Ent. Soc. of NSW . . . ⊗ Dr A D Clift
Ent. Soc. of Vic . . . ⊗ Mr P Cawardine
✦ Eligible for re-appointment
⊗ Not eligible for re-appointment
⊗ To be nominated by the Societies

If only one valid nomination is made for any position, that nominee will be declared elected at the AGM. If more than one nomination is received for a position, a postal ballot will be conducted.

Australian Entomological Society Inc.

NOMINATION OF OFFICER OR COUNCILLOR

I nominate

for election to the office of

Name of nominator

Signature

Date

I second this nomination

Name of seconder

Signature

Date

I accept this nomination*

Signature

Date

* This nominee is requested to attach a typed statement, not exceeding 300 words, which includes the following: professional qualifications, address, institution, position held, fields of entomological interest, previous offices or appointments held in the Society, any other information which may be of assistance to members should a postal ballot be required.

(A photocopy of this form may be used)

Australian Entomological Society Inc.

APPOINTMENT OF PROXIES

I, ...

of

being a member of the above-named Society,

hereby appoint

of

as my proxy to vote for me on my behalf at the Council Meeting, Annual or Special General Meeting, as the case may be, of the Society, to be held on 24-28 September 1994, and at any adjournment thereof.

Signed this

day of 19

Signature

(A photocopy of this form may be used)

THE AUSTRALIAN ENTOMOLOGICAL SOCIETY INCORPORATED

Provisional Agenda for 25th AGM

1. Opening
2. General Announcements
3. Announcements of Proxies and Apologies
4. Deaths of Members recorded since 24th Annual General Meeting
5. Minutes of 24th Annual General Meeting (Published in *Myrmecia*, August 1993)
6. Matters arising from these minutes
7. Executive Annual Report, including reports of Treasurer, Business Manager, Chief Editor and News Bulletin Editor
8. Committee Reports
Conservation Committee
9. Competitions and Awards
Research Grants
Insect Illustration Competition
Phil Carne Prize
Service Award
Ian Mackerras Memorial Medal
10. Business arising from the 46th Council Meeting, Cairns
11. Announcements of Office-Bearers and Councillors for 1995
12. Report of the Organising Committee, 25th Annual General Meeting
13. Report of the Organising Committee, 26th Annual General Meeting, Tamworth NSW
14. Other business (arranged with the Secretary no later than 15 August 1994)
Name of AES Journal - proposed constitutional change
15. Close

Paul MADGE
Honorary Secretary

MEMBERS PLEASE NOTE!

A very poor response has been noted in returns for the Directory of SW Pacific Entomologists. To ensure that this publication is complete all members must fill in the form.

Please do it now!

CONSERVATION COMMITTEE REPORT

After two postal surveys of around 200 institutions, the committee is assembling a list of current projects concerning the conservation of non-marine invertebrates. A brief version of the list will appear in a future issue of *Myrmecia*. It will also be sent to people who responded to the survey and be made available on request to members.

Lionel HILL
Convenor

OBITUARY

Murray McAdam Hay Wallace 1922 - 1994

Murray Wallace was born in Melbourne on the 24th of June 1922, the third son of Sir Robert and Lady Wallace. He graduated from the Department of Zoology of the University of Sydney in 1944, with first class honours in entomology, on the basis of a thesis on mosquitoes. Immediately after graduation he joined the Royal Australian Air Force as a Flying Officer, and served with a malaria control unit in Papua New Guinea.

In April 1946 Murray was appointed to the CSIR Division of Economic Entomology as an Assistant Research Officer, with a salary of £450 per annum. He was posted to Katanning, WA, with the task of testing the effectiveness of the new insecticides DDT and BHC in controlling the redlegged earth mite *Halotydeus destructor*. His work led to the widespread adoption of these chemicals by graziers, but Murray did not advocate their indiscriminate use. Instead he set out to determine whether their use was economically worthwhile, and developed a strategy for planning pesticide applications on the basis of market forces. He showed that under some circumstances graziers would be better off spending their money on fertiliser rather than pesticides. This example is typical of Murray's lifelong determination to ensure that the results of scientific research were used to the benefit of the growers and taxpayers who support it.

He quickly realised that pest control must be based on a sound understanding of the ecological processes governing the abundance of the target species and that the use of chemical pesticides could have undesirable side effects. He showed

that the elimination of predatory mites by the application of chemical pesticides caused man-made outbreaks of the lucerne flea *Sminthurus viridis*, a major pest of leguminous pastures. He was also acutely aware of the fact that the use of chemical pesticides would inevitably lead to the evolution of resistance. This led him to experiment with a variety of other control measures, such as pasture burning and the use of seed treatments, low volume sprays, and systemic pesticides. His ecological research during this period also examined the remarkable diapause mechanisms that allowed the eggs of *S. viridis* and *H. destructor* to survive the fierce WA summer. In 1949 and 1950 he continued these studies at Cambridge University, under Sir Vincent Wigglesworth. During this period he was an enthusiastic sportsman, and achieved distinction in both cricket and tennis. However, he found that insect physiology did not have the same attractions as field ecology and he returned to Australia to resume his ecological studies. At that time the Chief of the Division, A. J. Nicholson, was propounding the view that populations of animals were regulated by density-governed processes. Murray's efforts to understand the ecology of *S. viridis* provided an opportunity to examine this phenomenon, and provided a remarkable example of a self-regulating population mechanism in operation. He spoke passionately about the detrimental effects of western-style agriculture with its

dependency on calendar-based application of chemical insecticides and fertilisers. He expressed these views with special force in a lecture to the WA branch of the Australian Institute of Agricultural Sciences as early as 1959 when such views were not yet fashionable. He was very much aware of the complexity of ecological communities, even in an apparently simple system such as a clover pasture, and how the natural control of pests in those communities would be upset by the use of chemical pesticides.

The predatory mite *Bdellodes lapidaria* had long been suspected of contributing to the control of *S. viridis* in Western Australia, and it had been deliberately introduced into new areas throughout southern Australia for that reason. Murray's field trials confirmed its value, and led to its introduction into South Africa. The demonstration of the importance of this species led him to suggest that further biological control of *S. viridis* could be achieved if additional species of predators were introduced from overseas. He therefore spent a year travelling widely in Europe from a base at the Mediterranean resort of Antibes, searching for natural enemies of



Murray Wallace 1922-1994

[photo: John Green, CSIRO]

the redlegged earth mite and lucerne flea. He found that the identities of the most important predatory mites were confused, especially in the families Bdellidae and Anystidae, and that there were undescribed species of mites even in the pastures of Europe. As a result, he was inevitably drawn into mite taxonomy, which was to accompany ecology as a research interest for the

remainder of his career. He eventually published a major taxonomic revision of the Bdellidae with his long-term colleague and friend, Alex Mahon. It also became necessary to undertake taxonomic research on *S. viridis*, to allow it to be distinguished from several related species.

His work on the natural enemies of pasture pests led to the introduction of two species of predatory mites, *Neomolgus capillatus* and *Anystis* "species A", into Western Australia where they became successfully established. The latter of these species was eventually named *Anystis wallacei* in his honour. The search for further beneficial species was continued in a return trip to France in 1967, supported by a grant from the French government, and by trips to India, Morocco and South Africa.

During his period of 30 years in Western Australia, he also did ecological research on other insect pests, notably the pasture webworm (*Talis pedionoma*) and jarrah leaf miner (*Perthida glyphopa*). His work on jarrah leaf miner was initiated because this species appeared to have a summer diapause similar to those of *H. destructor* and *S. viridis* and because it offered an opportunity to test the usefulness of systemic insecticides, that were being developed for use in pastures, in a completely different situation.

In 1976 Murray was transferred to Canberra to lead the Division's high profile program on the biological control of dung and dung-breeding flies and to investigate the role of mites in the dung community. At that time, the dung beetle team comprised 45 people working in Canberra, Armidale, Rockhampton and Perth in Australia, Capetown and Pretoria in South Africa, Montpellier in France, and Athens in Greece. He changed the direction of the overseas components of the dung beetle program so that only the species suitable for introduction into Australia were selected for continued study. The result was that over 40 species of dung beetles were eventually introduced to assist in the burial of dung, sometimes with spectacular success. He worked hard to reconcile the differing interests and personalities of his large team and took a close personal interest in the work of every individual, from the most junior technician to the senior scientists. Apart from leading this large and complex research program, he found himself once again drawn into mite taxonomy. He undertook research into the identification and biology of the mites that are

phoretic on dung beetles, among the most important of which are the Macrochelidae. One result of that work was the introduction of *Macrocheles peregrinus* from South Africa into Australia to contribute to the biological control of bushfly and buffalo fly.

Throughout his career he was a productive scientific author, publishing over 50 papers. A feature of his published work is its diversity, ranging from the esoterica of mite taxonomy, to popular agricultural articles directly accessible to farmers. His contributions were recognised in 1983 by the award of a D.Sc. from the University of Sydney, of which he was justly proud. A complete list of his publications is included at the end of this notice. He was a skilful public speaker, with his success due in large part to his genuine respect for his audience, whoever they may be.

In 1951 he married the Sydney botanist Norma June Hibberd, and together they raised two children, Ricky and Stewart. Murray was devoted to his family, and enthusiastically shared in their interests and activities. From 1976 to 1986 the family lived on a small farm just north of Canberra, where Murray was able to indulge his love of the land while June ran a craft shop in the nearby Hall Village.

When Murray retired from CSIRO in 1984 he and June made a careful search for a suitable place to spend the next phase of their lives. They decided on a block of unspoilt bushland in the hills behind Tomakin, on the south coast of New South Wales, which commanded magnificent views out to sea and along the coast. Murray took a personal and active role in the construction of a pole house that blended harmoniously into the surrounding bush. He skilfully landscaped the surroundings of the house, despite the efforts of the local lyrebirds which insisted on scraping the leaf litter back onto his newly-cleared bush walking paths. During this period both Murray and June were among a small band of enthusiasts who worked hard to establish, with the support of local government, the Eurobodalla Native Botanic Gardens. They established a herbarium for the native plants of the south coast, of which some 1200 species are known. Their happiness eventually ended when June developed a progressive illness and, despite all Murray's devotion and care, she died in 1992.

After June's death, Murray continued his work on the Botanic Gardens and renewed his interest in playing golf. He attended an international

conference on botanic gardens in Rio de Janeiro, where the Eurobodalla project attracted considerable interest. Shortly after his return home he fell ill and was eventually diagnosed with malignant lymphoma. He fought the disease courageously for a year, at times with signs of hope. He eventually lost the battle on Sunday January 2nd, 1994, dying peacefully, as had June, in the house they had built.

Murray lived a full and productive life. His sincerity and openness made him very approachable and won him the unqualified respect of his workmates. The quiet and efficient way he organised his activities allowed him to achieve a great deal, both professionally and while pursuing his own interests. He was a loving husband and father and a true friend of many. His work has had, and will continue to have, a lasting impact on Australian entomology, both in the specific ecological communities in which he worked and in general, by ensuring that the biological control of pests is based on the highest standards of ecological and taxonomic research. He will be remembered with respect and affection by his colleagues, friends and family as one of nature's gentlemen.

I would like to thank Doug Waterhouse, Dick Norris, Erik Holm, and Ricky Wallace for their help in preparing this notice.

R.B. HALLIDAY

CSIRO Division of Entomology
Canberra

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LETTERS TO THE EDITOR

Lepidoptera Consulting Services
Sindia Red Sindhi Stud
Scrubby Creek Road
Gympie, Qld 4570

Dear Sir,

For over 20 years, since I first pioneered the World's first Village butterfly farming industry in Papua New Guinea in 1974 (Hutton, A.F., 1985, *ORYX* 19(3)), I have been battling to get funding for someone to actually do something positive for the future of the world's largest butterfly and to protect its habitat for ever.

So many "scientists" and "researchers" and others have come up with heaps of hogwash and theory and obtained PhDs etc for their work - in the case of the Alexandra Birdwing, *Ornithoptera alexandrae*, alone, I have now accumulated some 15 research papers and other documentation totalling over 5 kgs in weight covering the past 15 years - yet absolutely nothing positive has been done for the butterfly itself and not even its main pollen providing plants are even known or even its distribution! Indeed many of the "researchers" hadn't even visited its remote habitats other than a few localities near the main town of Popondetta in the Oro (formerly Northern) Province whose flag & logo features the Alexandra Birdwing! Many only

went to collect "research specimens" of protected fauna for illegal resale!

I found this out for myself when commissioned by the Australian Government in November-December 1993 to be the Conservation/Naturalist Consultant in a two-man team to draw up proposals for funding a five year Conservation and Research Project for the Butterfly for AIDAB (Australian International Development Assistance Bureau) with the leading Environmental Consultancy Firm CNPS Pty. Ltd., (who won the overall contract for the Consultancy), as part of Australia's new Specific Project orientated monetary grants as part of their Foreign Aid program for Papua New Guinea.

I spent two weeks on foot patrols in what I knew to be the butterfly's habitats on the Afore Plateau (the one site of a survey in 1990 by the Papua New Guinea University of Technology student team from Lae) and in the main remote habitats in the Menagalas and Hydrographer Ranges area of Papua New Guinea and my old villager friends there told me I was the first expatriate they had seen since I last spent time in their remote villages in 1977 when I was National Coordinator for the Papua New Guinea Government's Department of Environment and Conservation Insect Farming and Trading Project (1974-1978)!

Hardly surprising as there has been a law and order problem in many parts of that lovely country, blown out of all proportion by the Media, who have much to answer for, which puts the fear of death into newcomers to the country who have no knowledge of the language and believe everything they read in the newspapers!

We have now ascertained the butterfly's habitat to be three times greater than was previously recognised (officially) by specific sightings of, not only adults of both sexes, but also larvae and pupae and its range is now extended by some 150 km south into the Collingwood Bay area and some 100 km east into the Musa River catchment area and there is considerable evidence it exists in the headwaters of the Mambare/Kumisi rivers (the site of its original discovery by Alfred Meek in 1906) where several males were sighted by me, flying around a flowering "Kwila", *Itsea ibuga* tree, from a helicopter 17 years ago and another was sighted by a foot patrol in 1993 near the Kokoda Trail. As an added bonus I found that there are still healthy populations of the world's

second largest butterfly, the Goliath Birdwing, *Ornithoptera goliath*, in several of the same areas surveyed. During patrols made by me between 1965 and 1977 I found them in all three of these "new" locations and suggested a concentrated follow-up but very little was done, unfortunately, by those who were supposed to do it !

The butterfly is certainly vulnerable (though not as rare or restricted as previously thought) because of its limited habitat area and the continual expansion of Oil Palm projects and some highly questionable and suspect timber logging contracts with Singaporean/Malaysian & Indonesian logging companies. The achievement of a moratorium on all logging in the area was one major breakthrough.

Now my proposals and recommendations for the full five year research program IN THE FIELD IN THE BUTTERFLY'S HABITAT has been approved by the Australian Government and funding is in place I am very proud, as a Society member, to have had primary input into this satisfactory conclusion of my concerns going back over 30 years since I first went to Papua New Guinea from East Africa (Kenya) in 1962 for the future of the world's largest and probably most valuable butterfly - recent information indicates that the black market price for illicitly obtained specimens is around \$US2000 a pair!

At a recent PNG/AIDAB Forum held in Brisbane in November 1993 that I attended, it was announced that the Queen Alexandra Birdwing Project had been approved for funding and I was congratulated by the Deputy Premier of PNG, Sir Julius Chan (who was the keynote speaker at the forum) and other senior PNG Govt Ministers with whom I had discussions in Papua New Guinea while working on the Project.

The Australian Government is to provide \$4.29 million and the Papua New Guinea Government PNG Kina 0.19 million (estimate) for a 5 year comprehensive research program in the field. This is not going to be just another thesis-producing junket. Those eventually selected to carry out the study will already be highly qualified botanists/entomologists and it is only the butterfly and its habitat that will be the winners ! I think this has to be the largest financial commitment by the Government of any country in the world for the conservation of a single butterfly and for this the Australian Government deserves the greatest praise along with the Papua New Guinea

Government for its contribution

Angus F. HUTTON, F.Z.S., F.R.E.S.
Lepidoptera Consultant

Dear Sir,

Making Better Posters

Posters and poster papers are becoming an increasingly important part of Conferences and Workshops. They also provide a portable illustration of current research findings and so are useful additions to field days and other public meetings at which we scientists wish to communicate our findings to the public.

Eyecatching posters with clear messages are needed.

Prizes for the best posters were awarded at the recent OECD Workshop on "Soil Biota: Management in Sustainable Farming Systems" (Adelaide in March 1994). A panel of five judges assessed each poster and awarded points for four criteria (given below). A student prize and three open category prizes were presented. Posters were generally of a very high quality. However, the judging panel could see ways in which most posters could be improved, although some suggestions were mutually exclusive!

After the meeting, Penny Greenslade (CSIRO, Entomology) asked me about the criteria used to judge the posters and suggested that the readers of *Myrmecia* might benefit if the criteria were made available. This may help some make better posters. The criteria given below were developed with the help of Leigh Walters (CRC in Soil and Land Management, Adelaide) and are given as a guide and not as the last word in poster design.

Poster Evaluation Criteria

Overall Impact

This is based on first impressions. Does this poster appear interesting and eyecatching? Does the poster present information of importance to sustainable agriculture.

Presentation Style

Has the information been presented in a form which is interesting and easy to read?

Technical Content

Have the technical points been presented logically? Are there any technical flaws in the presentation? Is the information presented in a way that most people can understand the objectives and conclusions of the poster even

though they may not understand some of the detail?

Novelty/Innovation

Are the ideas or methods of presentation novel and/or innovative?

Award a mark from 1 to 10 for each of the four categories. Highest aggregate is the winner.

Bernard DOUBE

CSIRO Soils

Adelaide

REGIONAL NEWS

AUSTRALIAN CAPITAL TERRITORY

ANIC, ANU

The prime news of the quarter concerns local indications of an end to the recession, at least from as far as entomological employment is concerned. **David Yeates** is already ensconced as Lecturer in the Entomology Department of the University of Queensland and gave his first lectures within a few days of leaving Canberra's early winter. Databaser **Ben Thompson** has taken his computing (and e-mail) skills to become a programmer with the Health Insurance Commission. **Chris Reid** has accepted the entomological taxonomic position associated with the Cooperative Research Centre for Tropical Rainforest Ecology and Management. Chris will be based at James Cook University in Townsville, thereby adding to and complementing one of the larger groups of University-based entomologists in Australia. Another "product" of the entomology program at the Australian National University, **Mick Smith** had to fight off the job offers as his aquatic entomological skills coincided with an urgent demand from prospective employers throughout the nation. Mick took the hardship posting - and in May starts work with Conservation and Land Management to survey running waters of the north-west of Western Australia. From the perspective of a bureaucracy-riddled CSIRO, surveying the healthy rivers of the Kimberley and Pilbara sounds like something I could handle. Now for the homily (as **Terry Hillman** would put it): already there are more positions than there are personnel skilled in identification of aquatic invertebrates (and data analysis). Furthermore, many more positions will come from implementation of the Prime Minister's Healthy

Rivers Initiative. So where are these skills to come from? The limnologists have made most of the running, such as the Murray Darling Freshwater Research Centre's identification courses that provide excellent on-the-job training. The organisms involved predominantly are immature insects, of course, but have Australian entomologists recognised this?

Homily over - and with all best wishes for those departing to continue and expand their entomological activities we can bring more employment news, this time welcoming newcomers to Canberra. From furthest afield, acarologist **Matthew (Matt) Colloff**, lately of the Scottish Parasite Diagnostic Laboratory in Glasgow, has taken up his position in ANIC with the soil biodiversity group. Matt arrived in time to attend the Soil and Land Management International Workshop in Adelaide, along with **Penny Greenslade**, **Barry Longstaff** and **Ebbe Nielsen**. Matt clearly is preadapted to research in Australia, having already selected one field site proximal to the vigneron of Rutherglen. Seeking respite from Townsville's diversity of arboviruses, **Michael Braby** has migrated south for a few years to a postdoctoral position in ANIC, where he will rewrite Common and Waterhouse's "Butterflies of Australia". Just what constitutes a species in the world of lepidopteran varietal nomenclature is not the least taxing problem facing Michael - and the Coopers and Cladists discussion group no doubt will assist in the confusion. Joining the permanent staff of the ANIC after suffering the vagaries and fickleness of soft money for the past year, **Wendy Lee** will continue the schizoid-inducing working environment of having three bosses simultaneously, all requiring instant attention. A week's collecting with **Dave Rentz** and **Murray Upton** around Gwinganna "Ecoplace" in the Brisbane hinterland should provide some respite from their competing demands.

The deluge of publications emanating from Canberra will now have fallen from your copy of *Myrmecia* before you reached this contribution. However, all I will report here is the recognition accorded to major works from two of our most distinguished entomologists, both of whom are Research Associates in the ANIC. **Elwood (Zimmie) Zimmerman's** "Australian Weevils", which has reached five (of eight) volumes and **Ian Common's** first volume of the "Oecophorine Genera of Australia" (see page 35) provided the

opportunity to invite the then Minister for Science, **Chris Schacht**, and Dr **Thomas Lovejoy**, Assistant Secretary of the Smithsonian Institution to officially launch the works. The occasion was a welcome chance for friends, colleagues and officialdom to laud the taxonomic contributions of two great and productive practitioners (see photo below). I resist the temptation to comment upon ephemeral Ministers of Science.

Australian audiences seem a little jaded by the presentations of the American biodiversity industry, and the scientific benefits are elusive. This isn't to imply that nothing is happening in the scientific arena - the latest issue of the *American Zoologist* contains many stimulating papers on biodiversity. In reciprocation, an Australian perspective is getting quite an airing overseas with **Ebbe Nielsen** visiting Buenos Aires earlier this year for a meeting of the International Union for the Conservation of Nature (IUCN), and later on to London for a United Nations Environment Program (UNEP) Global Biodiversity Assessment workshop in The Natural History Museum (BMNH), late in April. Also attaining a higher profile overseas is **Mike Dallwitz** with the DELTA software. Fifteen people attended Mike's 3-day workshop in Beijing, sponsored by the Academia Sinica and 30 people participated

in the 4-day workshop organised by the Forest Research Institute of Malaysia in Sandakan, Sabah. The interactive identification opportunities provided by INTKEY are arousing much interest in diverse areas of biology and there is an increasing demand for products such as the Beetle Larva key that can allow relative novices to make accurate identifications.

Penny Greenslade has been travelling extensively within Australia, spending two weeks in Jan/Feb on the Atherton Tableland on field work for a Wet Tropics grant. Since then, Penny has made two trips to Antarctic Division in Hobart with reference to their biological sciences and human impacts programs, to Adelaide for the Soil Biota in Sustainable Farming Systems meeting with an extended road trip back visiting prospective sites and a trip to Sydney to discuss possible sites in Queensland for nominating to the National Estate Register and Collembola sampling in cotton fields.

At the Australian National University, **Penny Gullan's** lab has been rearranged to make space for the arrival of **Ireneo** (better known as **Jun**) **Lit. Jun**, from the Entomology Museum of the University of the Philippines at Los Baños, is an extension specialist, but is also undertaking a PhD on the systematics and biology of Philippine



ANIC Book Launch, 28 February: (L to R) Ian Common, Chris Schacht and Elwood C. Zimmerman. [photo: John Green, CSIRO]

mealybugs. Jun's arrival is timed well to coincide with the imminent visit of **Doug Williams**, the world's most productive coccidologist now in his retirement from the CAB Institute of Entomology.

Peter S. CRANSTON
Regional Councillor

CSIRO Entomology

As I write, an immense effort by staff of the Stored Grain laboratory is coming to fruition (or perhaps more appropriately - going to seed) in the form of the 6th International Conference on Stored Product Protection. Watch the August issue for details... Likewise the much-planned and long-awaited major renovation to Administration's "Centre Block" is about to start - scheduled duration is 12-15 weeks.

And as usual, Entomologists have been out and about. **Richard Vickers** represented the Division at the First International Symposium on Insect Pheromones in Wageningen, Holland in March. Locally, cotton seems to be looming as a major theme. A large contingent from the Division attended/ presented at the World Cotton Research Conference, in Brisbane, and returned with highly favourable comments. **Joanne Daly** presented an invited paper at an OECD Workshop on BT transgenic plants in New Zealand, as did **Gary Fitt**. **Rick Rousch** is visiting the Division as a McMaster Fellow, working on development of resistance management strategies for transgenic plants, with particular reference to - you guessed it.... Rick has just completed three summer months in the field in sunny Narrabri, and he's now set for three glorious winter months in Canberra.

Perhaps **Andy Richards** can organise things better. Mind you, his previous field site choice was the pine forests of far north Scotland, where he studied population dynamics of the NPV of the vapourer moth, *Orgyia antiqua*. He's now joined the heliothis NPV project on environmental impact assessment studies in preparation for field-trialling of recombinant baculovirus insecticides.

Richard Milner, **Felice Driver** and **Judy Staples** visited AgResearch in Lincoln, New Zealand, where they participated in "The 2nd Lincoln International Workshop on Insect Pathogens and Their Use in the Management of Soil-Dwelling Pests", and a similarly entitled training course. Richard played an active role in the training, and is currently Expertly Advising on behalf of the International Institute of Biological Control's locust

Metarhizium project in Benin and Niger. The Insect Pathology group is now settled in their shiny wide-open-space laboratory suite, and appear pretty happy... The Meeting Room of that building was recently dedicated to the memory of **Tony Watson** in a ceremony attended by members of his family and a number of his colleagues.

"Nematodes and the Biological Control of Insect Pests" edited by **Robin Bedding** and **Ray Akhurst** (in collaboration with **Harry Kaya**) has now hit the shelves, and Ray has now also sent the Proceedings of the (relatively) recent 2nd BT Conference to the printer. They should be sent out/ available for purchase in June. Be quick!

David DALL
Regional Councillor

NEW SOUTH WALES - Metropolitan

Biological & Chemical Research Institute NSW Agriculture, Rydalmere

Martin Horwood has his hands full with fruitflies, with an outbreak in the Griffith region being inundated with irradiated sterile releases. Monitoring of the effectiveness of the releases will take up much of his time over the next few months. Martin has also been negotiating with the State Road Traffic Authority to boost the visibility of Fruit Fly Free Zone roadsigns and meeting with some resistance from RTA bureaucrats.

Western Flower Thrips has given **Grant Herron** and **Peter Gillespie** (along with various other NSW Agriculture staff) headaches and additional duties as monitoring and assessment of resistance levels is carried out.

Grant Herron's work on resistance attracted a visit from Mr **Zhu Cheng-cheng**, Mr **Zhou Xi Xing** and Mr **Zhang Jinhui** of the Ministry of Agriculture, PRC, in mid March. The Chinese delegation were also able to catch up on **Andrew Beattie's** work on citrus in China.

A meeting to consider a Plant Health Committee initiative to establish recognition of the specialist agricultural collections of Australia as a national resource was held at BCRI on 8 March. Representatives of most of the Agricultural Collections (both entomological and plant pathological) held in Departments of Agriculture/Primary Industries, as well as the Waite, the ANIC and AQIS attended the meeting. **Mali Malipatil**, **John Donaldson** and **Dennis Hopkins** all stayed on for a day or so to work with

colleagues at BCRI.

Murray Fletcher and **Peter Gillespie** attended the Common/Zimmie book launch in Canberra on 28 February and took the opportunity to catch up with ANIC entomologists.

Andrew Beattie continues to have major activity on the citrus front with **Zhongmin Liu** (BCRI-based Univ. of Sydney PhD student) working on citrus leafminer which has attracted enormous response from the public after a few, relatively minor, press releases. **Debbie Rae**, **Duncan Watson** and **Andrew** flit backwards and forwards between BCRI and Guangdong, China, developing integrated control programs for citrus pests in China. Andrew is also getting valuable results from projects on control of red scale, citrophilous mealybug and lightbrown apple moth.

Barry Wallbank and **Fadi Saleh** attended the 6th International Working Conference on Stored Product Protection in Canberra during April and Barry presented a paper on the effectiveness of residual insecticides on warehouse beetle.

Recent visitors to BCRI have included **Nigel Armes** (Int. Crops Research Institute for the Semi-Arid Tropics), **Ian Denholm** (Rothamstead) and **Nick Perepelicia** and **Bruce Baker** (SA Dept Agric. Pest Eradication Unit).

Macquarie University

Life among the aphids in April saw the graduation of three old aphids, **Eren Turak** (MSc) and honours students **Ian Blair** and **Darren Chisholm**. Eren is now working with the Environmental Protection Authority, Ian is at Prince of Wales Hospital and Darren at BCRI Rydalmere. **Lilian Blanco** has submitted her Ph.D. thesis on aphid-plant interactions and her funding on a small ARC grant is almost exhausted. She'd be glad to hear from anyone with work to offer!

Rita Holland has moved entirely to nematodes with **Keith Williams**. Are there any aphids left? **Dinah Hales** is in the midst of back-to-back semesters with double teaching loads, but managed to get away for a couple of weeks last year for "Critical Issues in Aphid Biology" in Ceske Budejovice (Czech Republic) and "Aphidophaga 5" near Nice. Her paper in C.B. showed that, if there is a *Myzus antirrhinii*, it is present in Australia. *Myzus persicae* workers beware; they're not easy to distinguish. **Paul Sunnucks** has been sinking under a load of writing but will be back in the lab when you read this. **Michael Watt** has been

working part-time among the aphid cultures as a preliminary to honours in second semester, when we hope to have **Christophe Gautier** starting his MSc. And last but not least, **Ashley Edwards**, honours student, and **Dinah** have been rearing batches of 10,000 synchronised *M. persicae* to make a cDNA library, in association with **Ron Hill** and **Gerry Hannan** at CSIRO Biomolecular Engineering.

As part of their continuing search for novel antibacterial compounds from insects, Professor **Andy Beattie's** group has begun to investigate immune and non immune hemolymph from Australian native insects. **Jim Mackintosh**, a Ph.D. student involved in the project, would be very interested to hear from anyone who is working on a similar project, or who thinks they could be of assistance. Jim is particularly interested in obtaining insects. These need to be large enough to immunize, of wildtype genome, and conducive to laboratory rearing. Jim can be contacted on (02) 805 8156.

Life in the Westoby Lab is pretty quiet, since 3 of the members (**Ros Blanche**, **Lou Rodgeron** and **Michael Dunlop**) have hidden themselves in order to write their Ph.D. theses. Who will be the first to finish? Only one guess required.

Research Division

State Forests of New South Wales

David Spolc has accepted a three year post graduate scholarship from the CRC on Tropical Pest Management, based at the University of Queensland. His studies will involve three dimensional modelling of the impact of invertebrate pests and environmental factors on the growth patterns of eucalypts. David's leave commenced on 23 February.

Two Honours students (**Craig Arms** and **Lisa Brown**) from the University of Newcastle (Environmental Assessment and Management degree programme, Dept. of Geography) have joined the Biology Section team involved in this years phase of the Sydney blue gum (*Eucalyptus saligna*) dieback research project in Olney State Forest (part of Psyllid / Bell minor program). **Christine Stone** will be their principal supervisor. The experiment is aimed at assessing vegetative competition effects on *E. saligna*. Their work commenced in March with pre treatment foliage assessment, followed by treatment applications (under storey clearance and stem injection) in the

second week of April.

Chris Ann Urquhart recently spent two days working with State Forests, Northern Region's field crews at the Friday's Creek and Kennaie Creek eucalypt pest and disease study sites near Coffs Harbour. Chris Ann has further confirmed her adventurous nature by returning unscathed from a tour of parts of Turkey and immediately launching into a two day 4-wheel drive training course.

Darren "Mozzie-bait" Waterson has once again headed north to Papua New Guinea for four weeks on secondment to the Army Malaria Research Unit as part of his required Army Reserve commitment.

Bob Eldridge addressed a Standards Australia seminar held in Sydney on 11 April. The seminar was aimed at users of the new Australian Standard AS 3660 "Protection of buildings from subterranean termites - Prevention, detection and treatment of infestation".

Lou RODGERSON
Regional Councillor

Department of Medical Entomology University of Sydney at Westmead Hospital

Richard Russell, Marilyn Geary and Steve Lindsay have been kept very busy with monitoring the mosquito populations associated with the Homebush Bay area and the Olympic Games development sites. In March Richard visited Port Hedland in Western Australia to assist **Tony Wright** (WA Dept of Health) with a mosquito control training course for health and environmental officers from the Pilbara and Kimberley regions.

Richard also attended the annual conference of the Australasian Society for Infectious Diseases held in Canberra in March, and presented an invited address on insect vectors of disease in Australia.

Gisli Mar Gislason from the University of Iceland spent February and March at the department on study leave and was occupied with an investigation of the oviposition sites of the saltmarsh mosquito *Aedes vigilax* at Homebush - a component of Richard's study program.

John CLANCY
Regional Councillor

NEW SOUTH WALES - Country Areas

NSW Agriculture

Wollongbar Agricultural Institute, Wollongbar

Neil Treverrow has just concluded a three year

project, sponsored by the HRDC and the Banana Industry Council, on managing the Banana Weevil Borer. This included a hectic series of growers' nights. With this behind him, he now commences another three year project, this time emphasising the role of plant physiology in the IPM of Banana Weevil Borer.

University of Sydney Orange Agricultural College

This college has a research program for Sustainable Pest Management, which includes several projects. "Sustainable Orchard Pest Management" is being undertaken by **Bruce Valentine**, a research student, under the supervision of **Graham Thwaite** and **Geoff Gurr**. This Horticultural Research and Development Corporation/ industry funded project is currently in its second field season. Results to date indicate that insect growth regulators being evaluated do control lepidopteran pests at least as well as azinphos methyl, and lead to an enhanced natural enemy fauna, which in turn has significant benefits for mite management.

"Fruit Protection by a Vegetable Oil-Based Adjuvant" is also funded by HRDC/industry but is only in its first year. This is being undertaken by **Mohammed Golam Nabi Azam**.

The college has also recently won funds from a University of Sydney scheme aimed at boosting infrastructure and facilitating collaboration. This will allow **Geoff Gurr** to pursue research on resistance mechanisms to the Potato Moth, *Phthorimaea operculella*, with **Fred McDonald** by collaboration with **Paul Bailey** of Monash University.

Other than research we are also organising a Sustainable Agriculture Workshop for mid April, and are delighted to have the prominent insect ecologist and biocontrol expert **Steve Wratten** as a key speaker.

Agrisearch Services, Orange

Bill Farnsworth (Innisfail, Queensland) and **Martin Collett** (Orange, New South Wales) of Agrisearch Services Pty. Ltd. have been busy netting buffalo flies as part of a research project funded by the Meat Research Corporation. The aim of the project is to survey and document the levels of insecticide resistance present in populations of buffalo fly on cattle throughout Queensland and northern New South Wales. Data generated over the next two years will hopefully

contribute knowledge that will lead to better management of current and future insecticides and IPM strategies used for buffalo fly control in cattle.

If anyone has queries about the project, or would like further information, please contact **Martin Collett**.

Murray Darling Freshwater Research Centre, Albury

Those entomologists at the centre would like to pay tribute to **Tony Watson**, a valued friend and colleague, who will be deeply missed by all.

The annual Taxonomy Workshop was held at the Centre from 15-17 February and this year the oligochaetes and chironomids held centre stage. **Adrian Pinder** (Museum of Victoria) presented his new key to the oligochaetes of Australian freshwaters on which he has been working with **Ralph Brinkhurst**, in America. **Peter Cranston** (ANIC), fresh from the International Chironomid Conference at Rottneest, presented his 300 page key to the Australian chironomids. **John Hawking** also presented his guide to keys to identify all Australian freshwater invertebrates. The three guides can be purchased from the MDFRC (see details page 35).

After the workshop **Peter Dostine** stayed on in Albury to work with **John Hawking** on their guide to dragonflies of the Northern Territory. **Terry Hillman** and **Daryl Nielsen** attended the International Chironomid Conference in Canberra, where they thoroughly enjoyed attending the sessions and sampling the contents of the **Peter Cranston** liquor cabinet. **Helen King** managed to sneak away from her chironomids to attend the Health of the Rivers Conference in Canberra.

Tim New (LaTrobe University) called in on his way home from Canberra and spent a few hours with **John Hawking** putting the finishing touches on their dragonfly diet and egg development papers. **Gunther Theischinger** on route to Tasmania called in and spent some time with **John Hawking** discussing dragonflies, of course.

NSW Agriculture

Yanco Agricultural Institute, Yanco

David James' research on pheromones of beetles, stink bugs and assassin bugs is progressing very nicely and has strengthened his conviction that the use of semiochemicals in pest management has enormous potential. Collaborative research between Yanco and the

USDA in Illinois has resulted in the identification, synthesis and demonstration of bioactivity of the aggregation pheromone of *Carpophilus davidsoni*, a sap or dried fruit beetle species which is currently the most important species affecting ripening stone fruit in Australia. There are now synthetic pheromones available for all three of the *Carpophilus* species which affect ripening stone fruit. David's research aims to develop management strategies (e.g. mass-trapping, mating disruption, monitoring) for *Carpophilus* spp. using pheromones. Other insects which are also occupying David pheromally include spined citrus bug, green vegetable bug and the reduviid *Pristhesancus plagipennis*. Despite all this semiochemical activity, David still finds time for mites, particularly his celebrated "acaroheroines" Doreen and Victoria, which are the basis of his "Wine, women and vineyard mite control" program. He is also busily sorting data on *Eupalopsis jamesi*, a newly discovered predator of the citrus red scale, which he will present at the International Congress of Acarology in Ohio during July.

NSW Agriculture

Australian Cotton Research Institute

Lee Chin Tui, an entomologist with the Malaysian Cocoa Board, recently spent two weeks with **Neil Forrester** for training in insecticide resistance monitoring and management techniques. The Malaysian cocoa industry is concerned with potential resistance developing in the cocoa pod borer, a key lepidopteran pest of cocoa. Lee also visited the commercial *Trichogramma* egg parasite insectaries in Moree and Pallamallawa.

Numerous cotton researchers passed through Narrabri Research Station after the inaugural World Cotton Research Conference in Brisbane in February. The four-day post-conference field trip finished in Narrabri and many overseas researchers were able to view first hand some of the exciting new research areas in cotton entomology, etc.. To take advantage of this concentration of entomological celebrities, an entomological "summit" meeting was organised for the National Parks cabins on the top of Mt. Kaputar. Those entomologists who made it to the top included: - **Rick Roush** and family and **Winfield Sterling** (USA) and **Ian Denholm** and **Frank Byrne** (UK), as well as locals **Robin Gunning**, **Neil Forrester** and **Gary Fitt**.

The Murray Darling Basin Commission visited the Narrabri Research Station in April to discuss research being undertaken to reduce the environmental impact of cotton growing on the riverine system. **Neil Forrester** and **Gary Fitt** attended the OECD-sponsored Workshop on the "Ecological implications of releasing crops containing Bt toxin genes" held in Queenstown, New Zealand in January.

Robert Mensah has a new PhD student, **Mozzem Khan**, working on biology, ecology and control of mirids in cotton, under one of the CRC scholarships at the University of New England. Robert's own work on IPM in cotton is progressing well with early results comparing very well with conventional insecticide spray plots.

Richard FAULDER
Regional Councillor

NORTHERN TERRITORY

DPI&F Entomology Branch

One might think that the disappearance of our captain **Stuart Smith** (some say he's jumped ship to hunt fruit flies in Mauritius) has left our small dinghy of entomological knowledge rudderless, drifting on a sea of insects and forced to try fishing for our survival. Not so, not so!

John Duff and **Mike Neal** are busy surveying bananas for nematodes and insects in the Darwin and Katherine areas. They've also collected several species of parasitic wasps on scales on pawpaws.

Elliott Crowson has begun inspections of produce to comply with melon thrips (*Thrips palmi*) quarantine regulations imposed by WA, SA and Tasmania. Melon thrips research has retreated to the laboratory over the last few months due to a virtual disappearance of the beast in the wet wilds of abandoned market gardens. Our first parasite, *Goetheana shakespeariei* Girault, was isolated from melon thrips grown in our own insectary!

DPI&F Weeds Branch

I know I'm preaching to the converted here, but plant pathogens are essentially pretty boring. **Ryan Zonneveld**, from the CSIRO Division of Entomology in Brisbane, brought up a culture of a new mimosa pathogen, called *Phloeospora mimosae-pigrae*, in March and it was released in a blaze of media attention. **Debbie Van Rangelrooy** had her painted "Frosted Grape"

fingerprints, artefacts of little brother's wedding the previous evening, splashed across the Nation's TV screens. **Wendy Fomo** of CSIRO and **Allan Tomley** of the Queensland Department of Lands (an entomologist turned plant pathologist if you can believe it!) visited in April to see how the pathogen was faring. There were a few tiny brown marks that might have been evidence of the pathogen, but then again they might just have been tiny brown marks.

Grant Flanagan went to Adelaide over Easter with the NT junior volleyball teams, largely to keep an eye on CSIRO's **Alan Andersen** who was coaching one of them.

There was a major earthquake in Sumatra during February. **Colin Wilson**, who was visiting the Marihat Research Station near Medan in northern Sumatra at the time (as part of an ACIAR-funded project on biological control of *Chromolaena odorata* or Siam weed) swears that the earth didn't move for him. He also visited Nusa Cendana University and the Sub-Research Station for Livestock Production in west Timor. He now has just enough Indonesian language skills to get himself into trouble, but not enough to get himself out again.

Northern Territory Museum of Arts and Sciences

Graham Brown has been spending a lot of time planning lately: writing Action Plans and Collection Policy Statements, attending Open Day planning meetings, etc etc. He's hardly had time to scratch himself, which is just as well since he discovered a nest of appropriately named fire-ants in his garden and observed the remarkable size polymorphism amongst the workers from very close quarters. He's also spent the odd day chasing dragonflies, but didn't say whether he'd caught any.

Jenny Webber, meanwhile, has produced an insect kit for primary schools, giving information on such things as how to observe fire-ants without getting bitten, and how to catch dragonflies.

CSIRO Division of Wildlife and Ecology Tropical Ecosystems Research Centre

Alan Andersen spent the Easter week coaching the NT U/21 Women's volleyball side at the National Junior Championships in Adelaide. It was about as far away from entomology as you can get and he enjoyed every moment. Unfortunately he had to skip the finals to attend an ANCA workshop

in Canberra on endangered ecological communities. The joke of the season is that Alan now has a regular (monthly) talk-back segment on ants on ABC radio in Darwin. After chatting for a few minutes on something interesting about ants, the lines are opened for the public to ask questions and tell of their own experiences with ants. Perhaps **Graham Brown** could provide an entertaining tale or two.

Lyn Lowe is now a (part-time) BSc student at NT University and in her spare working time continues to sample and sort through insects from the Kapalga fire experiment. **Scott Morrison** spent all of February hiking through the escarpment country of Kakadu. He was, of course, suitably equipped at all times with forceps and tubes of ethanol. **Hanna Reichel** has commenced the arduous process of writing up her thesis on NT rainforest ants. She has ant specimens coming out of one ear, and computer print-outs from the other.

CSIRO Division of Entomology Salvinia Project

Project leader **Mic Julien** recently visited **Michael Storr** in Kakadu to survey the scene and discuss options for future control of salvinia. The project is now in write-up phase and a management strategy aimed at improving control will be presented to ANCA in the near future.

CSIRO Division of Entomology Tropical Ecosystems Research Centre

When I chased **Grant Farrell** for his quarterly contribution, he told me he couldn't oblige this time because he was in the middle of a pee-pee evaluation. It sounded rather personal, so I didn't ask him to elaborate, but a call to his colleague **Mark Lonsdale** illuminated the story. They are both undergoing one of the regular CSIRO rituals known as a Performance Planning Evaluation, whereby a deserved promotion is only awarded after a fixed degree of anguish has been suffered by the candidate. The horrifying prospect of all this for the Regional Councilor is that next time contributions are solicited there will be six months worth of rubbish to edit.

Office of The Supervising Scientist Alligator Rivers Region Research Institute

Peter Dostine recently attended the sixth taxonomic workshop to be hosted by the Murray-

Darling Freshwater Research Centre at Albury, NSW. Sessions were held on the limnological bogies - aquatic oligochaetes and chironomids. Speakers **Adrian Pinder** (NMV) and **Peter Cranston** (ANIC) did an excellent job in inspiring a sceptical audience to tackle these groups. After the workshop, Peter spent a few days at MDFRC discussing odonate larvae with **John Hawking**.

Recent visitors to ARRRRI included **Sam Lake** (Monash) and **Richard Marchant** (NMV), both here as supervisors of PhD student **Michael Douglas**. Michael is in the terminal stages of sample collection for a project on the effects of forest burning regime on stream communities at Kapalga. Anticipated visitors to ARRRRI include **Winston Ponder** (Australian Museum), here to collect gastropods, and **Tom Weir** and **Murray Upton** on a northern safari to collect gerriids and related taxa.

Michael Smith (ANU) was awarded First Class Honours for his project on recovery of benthic communities in a stream receiving acidic mine drainage. In recognition of his ability to conduct sampling programs in remote and hazardous environments, Michael has been selected to sample streams in the Kimberley and Pilbara regions as part of the Commonwealth's Monitoring River Health Initiative.

Department of Health and Community Services Entomology Branch

The salt marsh mosquito *Aedes vigilax* has been hanging on longer this year near Darwin than ever previously recorded. This activity through the wet season follows record plagues of this species at the start of the wet. It has kept the Branch busy with additional larval surveys and helicopter control operations.

There have been sera conversions to Murray Valley Encephalitis Virus in the sentinel chickens across the Top End of the NT in February, which has led to a stepping up of our media awareness programs and increasing our efforts in virus isolation from mosquitoes. **Gwenda Hayes** has been busy sorting and processing live mosquitoes from the vicinity of the sentinel flocks around Darwin and we are waiting for the results of virus isolation from the DPI&F.

The detection of imported *Aedes aegypti* and exotic *Culex* spp., including pupae, in large tyres at a shipping yard in the Darwin Port area has kept **Brian Montgomery** and **Ross Nowland** busy in March. The tyres had come into the port three

days earlier from Balik Papan in Indonesia. The quarantine authorities treated the offending tyres, but the Branch had to conduct the wider measures, including tyre surveys, adult fogging, larviciding in the general area, and sterilization of other tyres in the vicinity. The routine *Aedes* egg traps in the area have not detected any *Ae. aegypti* and we are confident the importation has been eradicated.

Peter Whelan was host to a contingent of senior health personnel from eastern Indonesia in March. They discussed medical entomology requirements in Timor and neighbouring islands. Peter also attended the Microbial Control of Mosquitoes seminar in Penang at the start of March, where he met with medical entomology and health research people from Malaysia, Taiwan, Korea and Singapore. He delivered a paper on B.t.i. use in north Australia and caught up with **Peter Ebsworth**, who outlined some good results he is achieving in malaria reduction at a mining town in West Irian.

The Branch was host to the 2nd Preventative Medicine Company of the Army in March, under the guidance of **Captain Yves Stanislas**. The Company undertook a mosquito survey of the Nabarlek area in Arnhem Land and uncovered some relatively rare larvae to add to the NT collection.

Brian Montgomery attended the Mosquito Control Course in Port Hedland in March and delivered a number of lectures on physical control and other mosquito surveillance and control methods used in the NT.

Gwenda Hayes has been organizing and preparing the data of the various mosquito monitoring programs in each of the major towns in the NT. She has also been familiarizing herself with fogging equipment and procedures, while she conducted a number of fogging operations around recent imported malaria cases in vicinities where there were relatively high numbers of *Anopheles farauti*.

The Branch was host to the NT Minister for Health in February. He discussed the Branch programs and was very impressed with the level of information on mosquitoes and the control achieved by our programs.

Currently the Branch is involved in base line studies of *Culicoides* in the Darwin Harbour. The study has highlighted the very considerable potential problems of *C. ornatus*. The NT University is currently advertising a three year PhD

scholarship to investigate the biology of *C. ornatus* in Darwin Harbour. Anyone interested should contact **Dave Parry** at NTU on 089 466701 as soon as possible.

Wildman River Cashew Plantations

Shaun Hood is now well into the second year of his project and concentrating on the mango tip borer (MTB). He has developed effective larvae and pupae sampling techniques but has had no luck yet with eggs. He is currently performing bagged and unbagged cohort survival experiments in both sprayed and unsprayed zones to evaluate the role of MTB predators, and at the same time is monitoring the rate of field parasitism. This year the Plantation will use a more specific biological insecticide, *B. thuringiensis*, to control MTB, and Shaun will evaluate its efficacy using a combination of laboratory and field experiments.

During March Shaun had a visit from one of his supervisors, **Mali Malipatil** from the Institute for Horticultural Development in Victoria. Mali is interested in *Geocoris* sp., one of the MTB predators and apparently a new species (*shaunhoodii* perhaps?). Recently Shaun visited another of his supervisors, **Myron Zalucki**, at the University of Queensland, to revise his project direction.

Colin WILSON
Regional Councillor

NORTH QUEENSLAND

Environmental Health - Cairns

Progress is being made on implementing the "Dengue Fever Management Plan for North Queensland", which was the subject of a workshop held in November, 1993. Various educational materials have been either updated, such as a TV ad starring John Williamson and the logo "Screen it up, Slap it on, Tip em out", or devised, such as a presentation kit for use by community groups and a colour-in sheet for use by school children.

Serological and virological blood testing for the dengue virus is now available at the Townsville General Hospital, while there are plans to do the same at the Cairns Base Hospital in the next few months. This will reduce the time for the testing procedure considerably compared to the previous system, where processing was done in Brisbane.

In the mosquito surveillance area, the three regional health authorities and relevant local

councils in North Queensland are in the process of preparing written documents indicating how they dealt with incipient or actual dengue epidemics, and the extent of the surveillance they do in their particular area. **David Sinclair** is currently preparing a two day course on *Aedes aegypti* control for Environmental Health Surveyors, and a half day course in the same area for non-Environmental Health Officers. Both courses will be held this year. David attended the first meeting of the Queensland Arbovirus Advisory Committee in Brisbane on March 30. This committee will co-ordinate and advise on the control of mosquito-borne arboviral diseases in Queensland, and will be involved in vetting applications for research funding from the \$100,000 that will be allocated by Queensland Health in the above area commencing from the 1993-4 financial year.

Northern Australian Quarantine Strategy

Judy Grimshaw managed to tip-toe off to England for a few weeks leave in March. Apart from returning to Leeds, she spent some time with friends near Dartmoor (for a brief respite from the Yorkshire cold). She reports that the moors were just starting to blossom with primrose and celandine, with daffodil, iris and bluebell soon to follow. It is obvious she has shared too many trips with the Quarantine Botanist! Judy returned home through Hong Kong and to much sought after warmth.

QDPI - Mareeba and Innisfail

Don Sands and **Otto Fahey** (CSIRO Long Pocket) visited Mareeba in February to discuss fruitpiercing moth species with **Harry Fay** in planning the host-testing of egg parasitoids of *Othreis fullonia* from PNG. While in the north, Don and Otto managed to collect a few larvae of the rare *Othreis iridescens* near Tully.

March saw the release of "Bananas - Insect and Mite Management" by **Bruno Pinese** and **Richard Piper**. This 67 page book, financed by the Banana Sectional Group Committee of QFVG and the HRDC, details the biology, economic importance, biological control potential, and both cultural and chemical control options for all arthropod pests likely to be encountered in bananas in Queensland. The manual has been distributed to all commercial banana growers in this state, but additional copies have been made available for purchase through QDPI.

John Fellows visited QDPI Mareeba fleetingly at the end of March. He is undertaking a PhD on ant ecology at the University of Hong Kong.

Visitors to the Far North

Barry Moore spent 3 weeks at his Julatten property during March and indulged in the obligatory collecting. We expect to be seeing more (no pun intended!) of Barry in the north now that he has fashioned out something permanent in the way of shelter.

Dr Jun-ichi Kojima, Ibaraki University, Japan, returned to the Tablelands for most of April to continue his behavioural studies of swarming *Ropalidia* (paper wasps).

Department of Zoology James Cook University

With the academic staff again tied up with teaching, most of the interest this quarter comes from the postgraduate students. **Peter Juniper** joined the department to start his PhD. He will be working in seed predation in tropical rainforests with **Chris Hill**. **David Slaney** has mounted expeditions to just about every karst and pseudokarst region in North Queensland, earmarking sites and taxa for his studies of tropical troglobites with **Phil Weinstein**. Future research students also received a boost with the arrival in the department of **Eric Reye's** biting midge collection from University of Queensland. It is hoped that this reference collection will provide resource material for many a postgraduate research project in years to come.

U.S. Dept. Agriculture

Australian Biological Control Laboratory

In January, we received permission to export the melaleuca defoliating sawfly, *Lophyrotoma zonalis* into quarantine in Florida for further host-range testing. Several shipments of this sawfly and the previously approved weevil, *Oxyops vitiosa*, were dispatched during the first quarter of 1994. Quarantine testing of the weevil is progressing well. However, in quarantine, the first laboratory generation of sawflies invariably turns out all to be males, precluding any additional research.

Most of the staff of the ABCL were kept busy during the beginning of 1994, preparing the 1993 Annual Report (please contact us if you want a copy). Considerable extra effort was required to

prepare the revised list of *Melaleuca* herbivores, which formed a part of the Annual Report. This list now contains over 600 species of insects, of which more than 400 were collected on *M. quinquenervia*, the broad-leaved paperbark tree, the primary target for our research at the ABCCL.

In March, we submitted our request for permission to import into quarantine in Florida, the third of our top four potential biocontrol agents, the melaleuca psyllid, *Boreioglycaspis melaleucae*. A new priority biocontrol agent for research at our Brisbane substation, where research on this psyllid was performed, needs to be selected. Likewise, staff at our main laboratory in Townsville are also continuing to try to "thin out the contenders from the pretenders" since research on our current top priority insect, the leaf-blotching mirid, *Euceroconis suspectus*, is scheduled to be completed later this year. With over 400 insect species to choose from, and more still being found, selecting priority agents for further research is an interesting exercise as additional information comes to light during the course of field and laboratory work.

Harry FAY
Regional Councillor

S.E. QUEENSLAND

QDPI Plant Protection, Toowoomba

Brad Scholz visited Bundaberg in March to start a *Trichogramma* tomato trial. Brad is on record as admitting he is in love with *Trichogramma*, but night-time releases by candlelight is taking the romance a bit too far.

Thanks to the unflagging enthusiasm of **Richard Lloyd**, he and **Bernie Franzmann** have discovered an undescribed species of *Nysius* at Emerald. They were at the Fairbairn Dam at the time. The species is similar in gross morphology to the Rutherglen bug *N. vinitor*. The nymphs differ in features used by **Jay Bean** to separate *N. vinitor* from *N. clevelandensis*. This led to **Bill Steiner** USDA-ARS, Colombia, Missouri checking the species during his recent stay in Toowoomba using electrophoretic techniques. Bill says it is different to *N. vinitor*.

QDPI Plant Protection, Nambour

Geoff Waite has recently returned from a month long round-the-world trip visiting Hawaii, Washington D.C. and South Africa. In Hawaii, Geoff inspected macadamia orchards and talked

with **Dr Vince Jones** about control alternatives for *Cryptophlebia* spp and *Nezara viridula* on macadamias. He also attended the Pacific Entomology Conference and presented a paper on "Mating Disruption: In tropical fruits and nuts." In Washington D.C., fruitspotting bug pheromones were the subject of discussions with **Geoff Aldrich** of the USDA Beltsville labs. The egg parasitoid of *Cryptophlebia leucotreta* (false codling moth) was the subject of visits to Letaba and Zebediela Citrus Estates in South Africa.

QDPI Plant Protection, Applethorpe

Frank Page and **Peter Nimmo** attended a meeting of interstate researchers involved in the major interstate project - "Towards the Integrated Management of Codling Moth".

The field evaluation of codling moth granulosis virus formulations for control of codling moth will be finalised this season. Under our conditions the damage at harvest is not satisfactory commercially. Blind stung fruit are too badly damaged and the percentage of wormy fruit is too high. **David Eagling** Institute of Horticultural Development (Victorian Department of Food and Agriculture) is continuing laboratory studies to determine the effects of exposure to ultra-violet light on persistence.

While there, Frank and Peter looked at **Graham Thwaite's** trial/mating disruption experiment at Bathurst. Frank says that in large virus treatment plots that used bait spraying for Queensland fruit fly there was no damage. Some district orchardists have also had satisfactory results with bait spraying.

CRC For Tropical Pest Management

The Insect Pathology unit within QDPI has been disbanded as part of the down-sizing in the Agricultural Production Group. **Bob Teakle**, **David Holdom** and **Chris Monsour** are now attached to the CRC for Tropical Pest Management and retain access to the DPI facilities through equity arrangements with DPI. Bob is hoping to continue to make use of his experience in Bt and baculoviruses in projects and teaching.

David has a post-doc position within the Field Analysis and Application program in the Centre, and Chris has received a scholarship from the same program enabling him to study Bt/host/plant relationships for his Ph.D. With **John Rogers** and **Elaine Brough**, also of the CRC, they comprise half

of the organising committee of the Biopesticide Symposium to be held in Brisbane on June 9th and 10th.

John Rogers, David Holdom and Mark Wolton looked over the Bundaberg tomato industry and visited **Iain Kay** (QDPI, Bundaberg) and **Peter Allsopp and Peter Samson** (BSES, Bundaberg).

BSES, Bundaberg

BSES entomologists **Peter Allsopp, Peter Samson, Les Robertson, Keith Chandler, David Logan and Debbie Webster** along with rodent biologist **Paul Story** met in Ayr during March to review progress and plan work for 1994-95.

Peter Allsopp and Richard Milner met to discuss the use of *Metarhizium* for control of canegrubs and soldier fly. They subsequently visited **Gary Bullard** at Bio-Care Technology, Somerton (near Gosford), to discuss problems with registering, producing and distributing a possible product.

Private Sector

Dan Smith (QDPI, Nambour) and **Dan Papacek** (IPM P/L, Mundubbera) have just returned from three weeks' consulting to the Thai-German project for integrated pest management in selected fruit trees in Thailand. This is the second visit as part of a project to implement integrated pest management for Thai fruit growers. The crops they are working on at this stage are mainly citrus varieties, as well as durian and mango. The present pattern of pesticide usage in Thailand is nothing short of horrendous with some growers using up to 40 applications of mixed broad spectrum insecticides annually. In one example, a grower was applying a mixture of Dimethoate, Methyl Parathion, Permethrin and Methomyl as one of many applications during the season. Some of these compounds are available under up to 60 different trade names. It is not uncommon for growers unwittingly to mix 3 different brands of exactly the same active ingredient into the spray vat.

While over there, they kept their eyes open for promising beneficials for some of our more troublesome pests. During this expedition, after much searching, they were lucky enough to locate a small but active population of green coffee scale *Coccus viridis* with active parasites. Hopefully, these may prove beneficial for the control of *C. viridis* in Australia.

Gordon SIMPSON

Regional Councillor

SOUTH AUSTRALIA

Department of Crop Protection University of Adelaide

The organising committee of the 25th AGM and Conference are at present pre-occupied with preparations for the event, details of which appear on the enclosure with this issue of *Myrmecia*.

A state of controlled entropy has gripped the Department over the past 3 months or so with the on-going relocation of various labs. The old Eastern wing has now been fully abandoned, and is undergoing extensive renovations in preparation for the imminent arrival of PISA on campus. A little further up the hill Adelaide's answer to the Sydney Opera House, the new atrium-crested Primary Industries complex, is rapidly taking shape. Construction has begun, too, on the new library complex.

Adelaide's rose aphids are looking a little nervous - and with good reason! **Jörg Kitt's** rose aphid parasitoid *Aphidius rosae* is showing encouraging signs of establishment, having spread over a 5 km radius from its original release site at the Waite Institute in August last year. A conservative estimate in March put the numbers of mummies in the Urrbrae House rose garden alone at 50,000. Jörg has also reported promising signs of initial establishment in several towns in Victoria in which varying numbers of parasitoids were released in September last year. Jörg gave a well-attended talk at the Adelaide Botanic Gardens in March, generating intense interest amongst Adelaide's commercial and amateur rose growers. Jörg will visit Germany and Italy in May in search of further material to widen the genetic base of the newly-established Australian *A. rosae* population. While in Italy, Jörg will take the opportunity to discuss the project with Aphididae expert **Professor Trumbley** of the University of Naples.

Bill Frost has completed an Australia-wide survey of wheat crops for eriophyid mites. The mites, tentatively identified as *Aceria tosichella* and possibly a second *Aceria* species, were found to occur commonly in all the major cereal-producing states. S.A. and Victorian crops, however, had the largest populations both in terms of absolute density and relative percentage of spikes infested. *A. tosichella* is now provisionally recognised as the principal *Aceria* species occurring on cereals in the

northern hemisphere, and is presumably the vector of wheat streak mosaic virus. Bill will be working with **Jim Amrine**, of West Virginia University, on the taxonomy of the mites when he visits the U.S.A. in July and August.

Chris Madden attended the 12th International Symposium on Chironomidae in Canberra in January, presenting a paper titled "Pollution monitoring using chironomid larvae: what is a deformity?" Following the symposium, **Luc Janssens de Bristhoven** of the Catholic University of Leuven, Belgium and **Jaap Postma** of the University of Amsterdam, accompanied Chris back to Adelaide where they received training in Australian beer consumption.

Otto Schmidt gave an invited paper titled "Virus or not: Host manipulation in insect parasitic interactions" at the Australian Society for Biochemistry and Molecular Biology's biochemistry meeting in Perth on the 8th of April. **Eveline Bartowsky** and **Paul Dangerfield** visited the Mildura district in late March collecting the ichneumonid *Venturia canescens*. Eveline is comparing genetic differences in local populations as a component of her polydnavirus studies.

Andy Austin spent 2 weeks visiting the collections of the ANIC, the University of Queensland and the QDPI in late January. He also attended a meeting of the Plant Health Committee, a working party of national reference collections, at Rydalmere in early March.

As usual, students come and go. A new Ph.D student, **Muhammad Iqbal (Miq)**, has joined the Austin lab, where he will study the systematics of the scelionid tribe Baeini of the Australasian region. Meanwhile, **Nicky Agelopolous** has submitted her thesis and has taken up a postdoctoral position at Wageningen, and **Julie Cumow** has left the Keller lab to take up study at Flinders University.

Tom White has been busy with the preparation of the new Australasian Directory of Entomology, which it is anticipated will be released at the 1994 AGM in Adelaide this September.

Primary Industries

Dennis Hopkins attended a meeting at Rydalmere on 8 March to discuss the review of collections being conducted under the auspices of SCARM. The following day he caught up with several of the entomologists based at Rydalmere. **Greg Baker** attended a meeting of State

Quarantine Entomologists held in Canberra from April 13-15th. Travelling further afield, **Peter Bailey** departed Northfield on 9th April to carry out some foreign exploration studies seeking biocontrol agents for the weed, cutleaf mignonette. He will be in Spain, Portugal and Morocco until late May, when he will visit the U.S.A. to attend a fruitfly conference prior to his return to S.A.

S.A. Citrus Board

Lightbrown apple moth and citrophilous mealybug are once again causing headaches for SA citrus growers. **Andrew Green**, of the S.A. Citrus Board, and **Peter Bailey** (PISA) have recently established a program trialing the effectiveness of BT and insecticidal soaps in the post-harvest disinfestation of citrus for export, with a research officer expected to be appointed in the near future to tackle the problem.

A series of citrus IPM workshops held in the S.A. Riverland in April-May was attended by around 70 growers. Topics covered included insect identification, spray application, pest monitoring, IPM theory and international experience of IPM in citrus. The workshops were co-ordinated by **Andrew Green**, and presenters included **Geoff Furness** (SARDI), **Shaun Whitworth** and **Greg Moulds** (PISA), **James Altman** (Biological Services) and **Craig Feutrell**.

Mosquito Research Group University of South Australia

Grant Fleming submitted his thesis on the potential of *Mesostoma* sp. (flatworms) to control small-environment mosquitoes. We wish him well in his new job in Melbourne working with the Water Authority there. Meanwhile, **Prof. Alan Mead** returned from his trip to Indonesia full of energy to continue the biocontrol research where Grant left off.

Michael Kokkinn gave a talk on mosquito biology at a recent workshop held by the South Australian Health Commission. He stressed the need for studies investigating the population biology of vector species such as *Culex annulirostris*. In response to this, **Michael Stevenson**, of the Barmera Health Authority, took up the call and has begun a program of mosquito monitoring in a series of water bodies in his area.

Lawrie Bennett was consulted by the Tea Tree Gully Council on the potential for their newly-created wetlands to be mosquito breeding sites.

He returned full of admiration for the project and certain that a very useful collaboration could be developed.

This item would not be complete without some reference to **Michael Kokkinn's** fabled wind-tunnel, which has now had its first mosquitoes flown in it. The major conclusion of this pilot study was that wind velocity is everything. During this exercise a new unit was developed, the Arbitrary Wind Velocity Unit. There's a lot of it around!

CSIRO Entomology and Soils

The most significant event in recent times has been the OECD and CRC funded workshop on the Management of the Soil Biota, which was held in Adelaide in March. The meeting attracted many international visitors and several interstate entomologists. Oral papers were given by **Geoff Baker**, **Gupta** and **Bernard Doube** and several posters by local staff. Notably, **John Buckerfield**, **Peter Stephens** and **Bill Davoren** won prizes for their posters on earthworms as indicators of sustainability and earthworm influences on root diseases. The meeting focussed far more on microbiology than entomology, but the latter crept into several of the papers and posters (e.g. nutrient cycling and food webs under different agricultural practices) as well as being directly dealt with in others (e.g. pest management, extraction methods). The proceedings are available from the organiser, **Clive Pankhurst** (CSIRO Soils, Adelaide).

The annual Tillage Workshop was also held in Adelaide in March, again with a variety of talks given by Adelaide zoologists, mostly on current earthworm research. Looming on the horizon is the Vth International Symposium on Earthworm Ecology which **Geoff Baker**, **John Buckerfield**, **Paul Dalby**, **Ken Lee**, **Bernard Doube** and **Peter Stephens** will be attending in Ohio in July. There's a mad panic on now to get papers ready for that.

Jason Woods has joined the group to work with **Geoff Baker** on an LWRDC funded project on the role of earthworms in ameliorating soil acidity. Several field sites have been established in various parts of S.A. and in Victoria (Ellinbank, Rutherglen, Warrnambool) in collaboration with Dept. of Agriculture staff to assess the effects of earthworms on lime burial, soil properties and pasture production. This has meant much travel for the team and there will be much more before the studies are completed in November. Early

results from similar field trials last year in which the European *Aporrectodea longa* was introduced to S.A. pastures (from Tasmania) and increased pasture production by up to 40% in 5 months appear very promising.

John Buckerfield has been kept particularly busy lately with several visits to field days and workshops interstate to talk about the potential benefits from improved management of earthworms and current research, with a special mission to dispel beliefs that the tiger worms that are currently commercially available are useful in broad-acre agriculture.

Private Entomology Sector

The lucerne seed production season is coming to a close for **James De Barro** of Crop Monitoring Services. This season pest levels were lower than normal with budworm, green mirid and seed wasp all having a reduced impact. Many fields required one or two less sprays than previous seasons, with a few not requiring any form of control.

May will see the release of the Dryland Lucerne Establishment manual, co-authored by Crop Monitoring Services and PISA. The manual, designed to assist and encourage farmers to establish lucerne-dominant pastures, covers all aspects of lucerne establishment including paddock preparation, insect and weed control options and general management.

Bill FROST
Regional Councillor

TASMANIA

Dept of Primary Industry and Fisheries

Lionel Hill has finished field work for a 3 year HRDC project seeking a bee-safe chemical for control of onion thrips in fennel crops. He is now analysing efficacy data as well as phenological data and responses of various insects to white or yellow water traps. With HRDC funding, Lionel has employed **Bruce Haseler** to rear *Orgilus* and *Copidosoma* wasps for classical biological control of potato moth.

Forestry Commission

Anna Greener has retired to concentrate all her efforts into bringing up a young family and reinvigorating an old orchard.

Introduced bumblebees have resulted in buzzing bottles being delivered to the Commission Receptionist by members of the public.

Dick Bashford has been assisting **Peter Davies** with aerial spraying trials and their effects on aquatic invertebrates. Dick, whilst on holiday in the States, stayed with **Don Dahlsten** in San Francisco for a few days looking at the biological control agents from Australia and Tasmania in particular.

Parks and Wildlife Service

Mark Neyland is negotiating appropriate management for *Poa* grassland species which mainly survive on private property for the rare endemic butterfly *Oreixenica ptunnara*.

University of Tasmania

Dept of Geography and Environmental Science

Nick Porch is investigating the utility of fossil invertebrates in reconstructing Quaternary environments based on the Pulbeena Swamp deposits in NW Tasmania.

Postgrad student **Karyl Michaels** is investigating the effect of land management on the structure of ground beetle communities while **Helen Hocking** is determining the scale of variation in the insect fauna of streams in the Peiman River catchment in western Tasmania.

Peter McQuillan and **Greg Blake** are surveying coastal dunes in Tasmania for significant invertebrate fauna on behalf of the Australian Heritage Commission.

CRC for Temperate Hardwood Forestry

Congratulations to **Tony and Linda Clarke** on the arrival of their daughter Rebecca several months ago.

New students at the Centre are **Bradley Howlett** and **Zoltan Lukacs**, while **Mark Bandenberg** has joined the technical staff. CRC Plant Protection reviews were held a couple of weeks ago with **Lindsay Barton-Browne** the visiting reviewer.

Dept Agricultural Science

Haifeng Li has been awarded a PhD for his thesis on the phytochemistry of *Eucalyptus* spp with particular reference to *Chrysophtharta bimaculata* attraction.

John Madden and PhD student **Terry Bowditch** will be attending the 6th International Working Conference on Stored Product Protection in Canberra at the end of April.

Dick BASHFORD
Regional Councillor

VICTORIA

LaTrobe University

School of Genetics & Human Variation

Work on *Trichogramma* continues to expand, with some help from ARC. A new PhD student, **Tracey Bjorksten**, has started work on the responses of *Trichogramma* to *Helicoverpa*. Among other things, Tracey will be screening for strains whose acceptance of *Helicoverpa* eggs is not adversely influenced by rearing on a factitious host used for mass rearing. **Matthew Sorati**, an Honours student, is looking at inbreeding effects in *Trichogramma*. It is also hoped that a survey of incompatibility and thelytoky in *T. nr ivelae* will be completed. Meanwhile, **DeAnn Glenn** continues her PhD on *Trichogramma* parasitising light brown apple moth.

There is much excitement about the discovery of a *Wolbachia* infection in local populations of *Drosophila simulans* that does not cause sterility. This intracellular microorganism is normally parasitic but spreads because it causes sterility when infected males mate with uninfected females. Theory shows that for the newly-discovered infection to persist, it must have beneficial effects on its host. **David Clancy**, a PhD student, is busy testing this hypothesis. *Wolbachia* must rate as one of the most successful infections of insects as it has now been found in 15-20% of species tested so far by PCR.

Other new research includes an Honours project being carried out by **Andrew Weeks** on electrophoretic variation in redlegged earth mites, and ARC-supported research on responses to heat stress.

Lars Jermiin and **Stella Koulianos** have both finished their PhD studies and submitted their theses at LaTrobe University. Lars is still at LaTrobe, on a postdoctoral stint, and perhaps the fact that he has been very successful in having papers accepted by leading journals (including two rather difficult mathematical papers in the Journal of Molecular Evolution) will help him to get one of the extremely scarce ARC postdoctoral positions! Stella has left for a postdoc. in Switzerland, where her work on honeybee mitochondrial DNA sequence variation is expected to lead to insights into *Bombus* biology there. The rest of **Ross Crozier's** lab. look forward to catching up with Stella when most of them attend the Social Insects Meeting later this year.

Monash University

Dept of Genetics and Developmental Biology

Efforts continue in the use of molecular markers to elucidate population structure and movement patterns in the two major *Helicoverpa* pest species.

Merrin Spackman, funded by the Cotton Research and Development Corporation, has almost completed the initial Australian survey of variation in mitochondrial DNA of *H. armigera*. Merrin presented her data in February at the First World Cotton Research Conference in Brisbane.

The Department is collaborating with **Ary Hoffmann** at LaTrobe Genetics to assess variation in heat shock proteins (hsp) with respect to resistance to heat and cold stress in *Drosophila melanogaster*. **Gawain McColl**, now one year into his PhD studies, has perfected the techniques and is looking for associations between allelic variants at several hsp loci and stress resistance, both in a set of inbred lines and in lines selected for resistance. Honours student **Hayat Dagher** will examine the same lines for variation in expression of the different hsps.

Jodie Mannix, in her Honours project, is looking at heritable differences in metabolic abilities occurring between strains of *D. melanogaster* isolated from inside and outside of the Tahlk winery cellar. **Nikki Stokes** is working part-time and looking for allelic variation in a sodium channel gene in *Helicoverpa armigera*. This gene is of interest both for its potential to be related to insecticide resistance and for its potential to detect regional geographic differences. **Steve McKechnie** is away for three weeks in May to visit two research laboratories in Illinois.

Museum of Victoria

Invertebrate Survey Department

Activities in this department have been overshadowed by the demolition and rebuilding of half of the laboratory (with the other half due for renovation during the next financial year, it is a good excuse to keep a low profile). Much of the time has been spent moving collections and equipment around.

On the research side, several projects are advancing merrily along. The project on the invertebrates of the western Victorian basalt plains native grasslands was given a boost by a 12 month grant for **Amanda Kobelt** to complete a survey of all known remaining sites.

Even though the floods that hit northern Victoria

last spring delayed field work, **Graham Milledge** has not been twiddling his thumbs on the Save the Bush woodland invertebrate project. The Department of Conservation and Natural Resources, whose study sites we are using, had collected some invertebrate material in their earlier vertebrate study and Graham was able to sort and identify it.

Beverley Van Praagh has been employed as an "oddjobs" scientist. Beverley undertook conservation work on the giant Gippsland earthworm, conducted the summer adult counts of the Eltham Copper butterfly and is currently entering information on threatened Victorian invertebrates on the Victorian Wildlife Atlas.

Robyn Coy has shifted jobs from the East Gippsland forest beetles to studying the psyllid infestations of Victorian Central Highlands forests. Robyn is still supervising the East Gippsland beetle project; her replacement in the position is **Mark Collier**.

Victorian Department of Agriculture

Institute for Horticultural Development

David Williams and **David Eagling** visited Orange in late February to meet with other members of their codling moth IPM project team. Whilst in Orange, David Williams took the opportunity to catch up with **Col. Bower** for discussions on the final report of the apple dimpling bug project.

Bruce Hassler and **Craig Palmer**, from DPI Tasmania, Devonport, visited IHD in April to consult with **Simone Kriedl** on laboratory rearing of the parasitoids of potato moth. The potato moth work of the Tasmanian group (led by **Lionel Hill**) is part of the national programme on foliar pests of potatoes co-ordinated by **Paul Home**.

Andrew HENDERSON and **Alan YEN**
Regional Councillors

WESTERN AUSTRALIA

The Sci-Tech centre in Perth at present is featuring an exhibition developed by the Australian Museum called "Gargantuans in the Garden", which includes some excellent large, robotic insects. There is a *Sisyphus* dung beetle pushing a ball of dung, a mosquito drawing blood from a human foot, a huge praying mantis, a cicada and some weaver ants. In addition, there is a plethora of insect specimens on display (including **George**

Bornemisza's beetle collection), running videos and live insect colonies. The centre has been exceptionally well patronised with over 200,000 people going through over the 3 months it's on display.

Department of Agriculture

Entomologists at the department are in full migratory flight. **Rob Emery** is currently in Canberra attending the International Stored Grain Conference, while **Francis de Lima** is in Hawaii attending a joint USA-Australia workshop on "Disinfestation of Horticultural Commodities" working on the projected deadline for methyl bromide fumigation by the year 2000. **Jeroen den Hollander** is the new quarantine entomologist at the department, replacing **Tony Postle** who has been acting in the position for some 12 months.

Western Flower Thrips (WFT) continues to spread throughout the metropolitan area on both flower and greenhouse vegetable crops. Capsicums and chilli pepper crops have been severely affected by tomato spotted wilt virus (TSWV) in the past months. WFT is one of the most efficient insect vectors for transmission of TSWV, however a direct link between WFT and TSWV has yet to be proven, but the coincidence is uncanny.

Agriculture Protection Board

This year some 36 European wasp nests have been found and destroyed. Half of these originated from an overwintered nest found in Lesmurdie. The rest were scattered through various locations in the metropolitan area. Their spread is of some concern, so we're now establishing a grid-trap monitoring system using traps with a pheromone lure bait. The grid will cover the entire metropolitan area and will be an addition to the current system of education and relying on the public for wasp sightings. Special attention will be paid to industrial areas, because the introduction of hibernating queens in cargo from the eastern states is an increasing problem.

CSIRO

Associate Professor **Rick Roush** visited the Floreat laboratories for a week as part of a McMasters Fellowship. He delivered an excellent seminar on "Biotechnology and resistant crop varieties: environmental impacts?"

Curtin University of Technology

Dr **Jens Oleson** of Aarhus University, Denmark visited **Jonathon Majer** at the School of Environmental Biology over the latter half of 1993. Jens is a pollination biologist and whilst here, looked at factors affecting seed set in a number of proteaceae. **Jonathon and Natalie Keals** visited the University of New England to conduct the NSW part of the woodland insect canopy study. As in WA, gusty conditions made chemical knockdown virtually impossible to perform. As a result of this, a new sampling procedure has been developed - canopy shaking! **Jonathon** has recently returned from Vietnam, where he visited the University of Hanoi to set up a cooperative program in restoration ecology and other areas of environment management.

University of Western Australia

The new Zoology Department buildings were officially opened on 16th April by the Vice-Chancellor, **Professor Fay Gale**. It was great to see so many past students in attendance, including some of the original zoology students from the 1920's. Finally the Zoology Department moves onto the main campus of UWA after 70 years on the fringe of King's Park. **Masuzi Nuhariyati** has started her PhD at Zoology working on sound production and mating behaviour in Cicadellidae (leafhoppers). Professor **John Alcock** will be returning to the department in July/August, to continue his work on insect mating strategies. Future visitors will be mentioned in upcoming issues of *Myrmecia*.

David COOK
Regional Councillor

OVERSEAS NEWS

NEW ZEALAND

The "Butterfly Man of Kuranda" was developed by the Queensland Museum and is touring New Zealand during the next two years. The exhibition is at the Museum of New Zealand until May 22nd and already thousands of people have visited this spectacular exhibition. There is no need for a mere Kiwi to tell an Aussie about **Frederick Parkhurst Dodd** but a century on, his collection retains all the freshness, colour and vibrancy of a new display.

Considering we only have about 15 or so species of butterflies in New Zealand, we are quite envious of the multitude of Australian species.

Even our beetles and stick insects pale to insignificance! But our Wetas are a different story.

The exhibition goes to Auckland Museum on 7th July - 14th August, Manawatu Museum (Palmerston North) 25th August - 13th November and Otago Museum (Dunedin) 10th December - 5th February 1995.

John TENQUIST
Overseas Correspondent (NZ)

PAPUA NEW GUINEA

The following papers of entomological interest appeared in Volume 36 (number 2) of the PNG Journal of Agriculture, Forestry and Fisheries:

"Distribution and abundance of ants in a Brazilian subtropical coffee plantation." by J.D. Majer and M.V.B. Queiroz, pp 29-35

"A catalog of the Tessaratomidae of the world." by L.H. Rolston, R.L. Aalbu, M.J. Murray and D.A. Rider, pp 36-108

A major consultative seminar on the reorganisation of the Department of Agriculture and Livestock (DAL) was held in Port Moresby from 15-17 March 1994. The seminar endorsed the recommendation for the establishment of an autonomous National Agricultural Research Institute. Most of the entomological and other plant protection work in PNG would be carried out at this institute.

An autonomous PNG Quarantine and Quality Management Authority was also endorsed for establishment. Most of the DAL staff is expected to be transferred to the regions with a view to providing effective agricultural services to PNG rural communities.

The proceedings of the seminar will appear in print in late May 1994.

Ray KUMAR
Overseas Correspondent (PNG)

NEWS FROM AFFILIATED SOCIETIES

Entomological Society of New South Wales Inc.

The Christmas BBQ on the 4th December held at the State Forests research facility at West Pennant Hills was attended by 40 members and friends. Two light traps were set up in this unique setting which is one of the last remnants of native

forest in Sydney.

The Council for 1994 was elected at the Annual General Meeting held in March. **Alan Westcott** is President (also Circular Editor) with **Alan Clift** his Vice. Other members of the Council are **Alison Nicholls** (Secretary), **Ted Taylor** (Treasurer) **Mary Ann Terras** (Business Manager and Public Officer) **Dan Bickel** (Journal Editor), **Robert Spooner-Hart**, **Barbara May**, **Max Moulds**, **Courtenay Smithers** and **Martin Horwood**. **Peter Gillespie** was co-opted to Council at the April Meeting.

Alan Clift gave the Presidential Address on the dangers of the world wide trend away from discipline based groups towards the multidisciplinary approach. A summary of Alan's talk is in the *Circular of the Entomological Society of NSW* 437:2-3. An illustration of *Skeletodes tetrops* Newman, the citrus longicorn, by Alan Westcott is the Society's 1994 emblem. The same illustration was featured on the cover of the six issues of Volume 7 of *Australian Entomological Magazine* (1980).

The society also held meetings in February and April. Firstly, **Russel Cant** PhD student at the University of Western Sydney gave details on his work on the mysteries of the Bronze Orange Bug, an aspiring but unsuccessful pest of citrus. At the April Meeting **Liz Brooke**, who is currently working at BCRI, detailed her studies on the biological control of *Aedes aegypti* (Dengue fever vector) which was the subject of her MSc in Medicine at Sydney University.

Mary Ann TERRAS
for Alan CLIFT
Representative Councillor

Entomological Society of Queensland Inc.

The Society's activities for 1994 began with the AGM in March. **Lyndsay Barton Browne** was elected President and **Elaine Brough** Senior Vice President. **Robert Raven** retired from Council after many years of enthusiastic participation as Treasurer, President and Councillor.

Retiring President **Dick Drew's** Presidential Address, "Fruit Flies, a Basic Study in Case Research", gave an overview of his work on fruit flies in the last 25 years. He defined systematics as a complex of taxonomy, ecology and behaviour and stressed the importance of understanding systematics and of basic research in developing worthwhile pest and environmental management

principles. His address was warmly received.

Our speaker in April was **Mark Coombs**, formerly at the University of New England and now with CSIRO, Longpocket. Mark spoke on insects related to the oothecae of the praying mantis, *Archimantis lotistyla* around Armidale, their seasonality and the hatching rates of the mantids. Insects included dermestid larvae and micro-hymenoptera. Similar studies on other mantid species would be very rewarding.

Judy KING
Representative Councillor

Entomological Society of Victoria

At our April meeting **Amanda Cobelt** from the Museum of Victoria addressed us on "Conservation of Western Victorian Basalt Plains - surveying Grassland Invertebrates.

Our Annual General Meeting will be held on 17 June.

Peter CAWARDINE
Representative Councillor

COMING EVENTS



A.E.S. 25th AGM and Scientific Conference

**Napier Building
The University of Adelaide
24-28 September 1994**

A registration form for the 25th AGM and Scientific Conference of the Australian Entomological Society, to be held at the University of Adelaide 24-28 September 1994, is enclosed with this issue of *Myrmecia*. Completed forms should be returned to the conference treasurer:

Mr Gary Taylor
Treasurer, AES 25th AGM & Conference
Dept of Crop Protection
Waite Campus, Univ. of Adelaide
PB 1, Glen Osmond, SA 5064

BIOLOGY SCIENCE OLYMPIADS

BIOLOGY STUDENTS NEED YOUR HELP!

The Australian Biology Olympiad (ABO) program is managed by the Australian Science Olympiads and funded jointly by the Australian Government and private industry. The ABO provides students with a program of accelerated learning in biology and aims to stimulate an active interest in science, both theoretical and practical; to promote and reward excellence in scientific endeavour; and to have a team of four members represent Australia at the International Biology Olympiad competition.

Prospective students sit for the ABO Qualifying Examination in October. Normally students entering the Qualifying Examination would be in Year 11 but exceptional Year 10 students are considered. The Qualifying Examination selects approximately twenty students to attend the Biology Summer Training School held at the University of Canberra in January. The two week residential Summer School is staffed by professional scientists from Australian tertiary institutions and team members from earlier Olympiads and provides students with intensive tuition in all aspects of biology at an undergraduate level. The final Examination for team selection is held in March following the Summer Training School. The ABO team for that year will then attend an Easter Training School, which provides the final preparation before the team leaves for further overseas study and the International Biology Olympiad competition.

The syllabus typically includes the following subjects: The Cell, Biological Molecules, Genetics, Ecology, Biological Diversity and Evolution, Plants, Animals, Industrial Biology and Biotechnology.

In 1993, Australia competed for the second time in the Biology Science Olympiads. The Australian team did remarkably well with individual gold (1), Silver (2) and Bronze (1) medals and an overall second placing to China. Two members of the Victorian Cell Biology Society attended the farewell to these young people and we realised that the teachers coaching these students and the students themselves were in need of support from Australian biologists. The Victorian Cell Biology Society has decided to set up mechanisms whereby this support will be available to competing team members from 1994 onwards.

1. We want to establish the Biology Olympiad

Bursary, so that each team member will receive some financial support and recognition of their success in being chosen as part of the team of four. Other Science Olympiad contestants are supported by relevant Societies or Institutes and each team member receives a bursary of \$500. We hope the biologists will be able to match that figure and have asked Societies, Institutions and companies to help. Please make request of your institution or company to participate. Cheques should be made payable to the Biology Olympiads Bursary, c/- Dr G. Flannery, Treasurer, Victorian Cell Biology Association, Dept of Genetics, La Trobe University, Bundoora, Vic 3083.

2. We plan to establish a **National Register of Biologists** who are able to help with advice to teachers and team members and also in coaching team members. Initial selection of student candidates is made during the year by the schools. These candidates then compete in a national exam and finalists attend the Summer Training Camp in January when final selection is made. Persons on the National Register may be asked for advice by teachers at the school level, or to attend the Summer Training Camp run by DEET or for final coaching of the team before the Olympiad in the middle of the year.

The Victorian Cell Biology Society will run the Bursary and National Register for 1994 and 1995. After that it will be run for two years by the Australia and New Zealand Society for Cell Biology and thence by delegation to another Society so that eventually every biological Society in Australia will be able to participate.

3. Despite comprehensive press releases, no member of the press attended the farewell and press coverage of the success of the team was very slight. Biologists should put this on their agenda for attention at every opportunity. It is vital that we change this apathy towards scientific endeavour and achievements in the press and electronic media.

Please act immediately so that the 1994-5 teams receive the support they deserve.

If you want further information or wish to offer help, please contact

Dr Lynne Selwood,
President, Victorian Cell Biology Society,
Zoology Department,
La Trobe University,
Bundoora, Victoria 3083

Australia.

Ph.: (03) 479 2239

Fax: (03) 479 1551

Email: zools@zoom.latrobe.edu.au

If you wish to add your name to the National Register, you need to supply your name, address, telephone and fax numbers and an indication of your area of expertise.

XX INTERNATIONAL CONGRESS OF ENTOMOLOGY



Florence (Italy)
August 25 - 31, 1996
Palazzo dei Congressi

Information and copies of the registration form can be obtained from:

Organizing Secretariat O.I.C.
Via A. La Marmora, 24
50121 Florence
ITALY
Tel. ++39-55-5000631
Fax ++39-55-5001912

THE HORN SCIENTIFIC EXPEDITION TO CENTRAL AUSTRALIA 1894



A Commemorative Symposium Araluen Centre, Alice Springs 26-27 September 1994

A symposium to commemorate the centenary of the Horn Scientific Exploring Expedition to Central Australia will be held at the Araluen Centre, Alice Springs from 0830 Monday 26 to 1730 Tuesday 27 September 1994.

The Horn Expedition was one of the finest achievements of nineteenth century Australian science. From May to August 1894, a party of geologists, mineralogists, biologists and anthropologists travelled extensively through central Australia by camel. The Expedition was financed by W.A. Horn, a wealthy businessman, and produced a baseline of information about natural history and Aboriginal culture which is unique. Its results, published in a four-volume report, brought inland Australia to national and international attention.

The Symposium aims to reassess the significance of the Expedition. It will investigate the contribution that the Expedition made to knowledge of the environment and people of Central Australia, and re-examine that knowledge in light of the current understanding of the environment and cultures of the region. It will explore changes that have taken place in the landscape and human ecology of the region in the past 100 years. It will assemble a wide array of people interested in the history of both the natural and human environments of the centre of Australia.

Invited speakers will speak in the four sections of the meeting which are: The Horn Expedition, The Nature and Evolution of the Central Australian Environment, The Biota of Central Australia, Human Ecology and Human Impact. **Alan Yen** of the Museum of Victoria has been invited to speak on "Invertebrate Animal Life" in the third section.

Further information and registration forms from:

Steve Morton
Horn Symposium
PO Box 2111
Alice Springs NT 0871
Ph: 089 500111
Fax: 089 529587
Email: trevor.hobbs@dwe.csiro.au

THE A.J. NICHOLSON CENTENARY MEETING: ON THE FRONTIERS OF POPULATION ECOLOGY

**18-22 April 1995, Canberra,
Australia**

This scientific symposium is a special event to celebrate the birth of A.J. Nicholson (1895-1969) who was Chief of the CSIRO Division of Entomology between 1933 and 1960. It will include presentations on current research on the population ecology of organisms from a broad range of taxa, and from the perspective of theoreticians and applied ecologists.

Further details and First Circular are available from:

Mrs L. Lawrence
CSIRO Division of Entomology
GPO Box 1700
CANBERRA ACT 2601
FAX: (06) 246 400
Tel: (06) 246 4087
email: louisel@ento.csiro.au

NEW PUBLICATIONS

The Murray Darling Freshwater Research Centre, since 1989, has annually hosted a taxonomic workshop to promote the publication and use of working keys to freshwater invertebrates. The CRC for Freshwater Ecology is supporting the publication of keys emanating from the workshops as *Identification Guides*. The first two guides have been formally published and are available for purchase, along with the chironomid notes from the last workshop.

Guide No 1. "A preliminary guide to the identification of the microdile Oligochaeta of Australian inland waters" by A.M. Pinder and R.O. Brinkhurst (1994) 137pp. Cost (incl. postage within Australia) \$25.00. Cost for Europe and USA, \$30.00

Guide No. 2. "A Preliminary Guide to Keys and Zoological Information to Identify Invertebrates from Australian Freshwaters" by J.H. Hawking (1994) 36pp. Cost (incl. postage within Australia) \$15.00. Cost for Europe and USA, \$20.00

Workshop Notes. "The Immature Stages of the Australian Chironomidae, I. Keys, II. Figures." by P.S. Cranston (1994), 338pp. Cost (incl. postage within Australia) \$35.00. Cost for Europe and USA, \$45.00.

These publications are available from John Hawking, Murray-Darling Freshwater Research Centre, PO 921, Albury NSW 2640, Australia.

"Oecophorine Genera of Australia I, The Wingia Group (Lepidoptera: Oecophoridae)" by I.F.B. Common (1994).

Monographs on Australian Lepidoptera, Volume 3: i-xvi, 1-390, 712 figures.

Available from CSIRO Publications, 314 Albert Street, East Melbourne Vic 3002, and Apollo Books, Kirkeby Sand 19, DK 5771 Stenstrup, Denmark. RRP Aus\$100 (in Australia) or US\$100 (outside Australia).

Subscribers to the series "Monographs on Australian Lepidoptera" receive a 25% discount on the price of each volume.

This impressive publication is the first of a three volume treatise on the Oecophorine Genera of



Australia by Ian Common. The Oecophorinae, or mallee moths, have 5500 species (2277 named) in 275 genera (170 named) and are the second most species-rich family group of living organisms on the Australian continent.

The book covers the phylogeny, morphology, biology, diversity and distribution of the group, as well as providing keys and diagnoses of the genera and techniques for their study. A comprehensive bibliography is included.

The proposed phylogeny is very tentative as it is based on a Hennig86 analysis of 91 genera using only 33 characters. Character polarisation is based on a hypothetical ancestor with plesiomorphic states based on "general information on the Gelechioidea and other Lepidoptera". This implies that the author's understanding of the phylogeny of the group was the basis for the phylogeny given with the computer analysis mainly decorative. With the extensive experience that Ian Common brings to this group, this is probably a reasonable approach.

The section on morphology is very detailed and well illustrated and will serve as a basis for nomenclature and morphological reference for many other groups of microlepidoptera. An analysis of the complex structure of the abdominal pelt is provided and this may prove valuable for further characters of phylogenetic relevance.

The biology section is also very detailed, although poorly illustrated. In addition to life histories, host relationships, behaviour, an extensive section on pests and synanthropes and notes on parasites and predators, is a more personal section on collecting and rearing Oecophorinae, which draws on the author's extensive experience in this area.

The key to genera is easy to use and, although the terminology is often esoteric, all terms are described and illustrated in the morphology section

and the key couplets frequently refer users to relevant figures.

The bulk of the publication comprises a detailed examination of each genus providing type details, nomenclature, descriptions of adults, diagnosis, distribution, biology and remarks. A list of constituent species with type details and relevant nomenclature concludes each entry. Photographic and line illustrations of the adult, male and female genitalia, wing venation and other diagnostic features of representative species are given throughout the text.

It is difficult to find any criticism of this work. The standard of the taxonomic treatment, the quality of reproduction, particularly of the photographic images, and the presentation makes

the work a most attractive and valuable addition to an entomologist's library. The uniquely Australian nature of the mallee moths make the three volumes a highly significant contribution to our knowledge of the Australian entomofauna.

The next volumes to appear in the *Monographs on Australian Lepidoptera* will be "Checklist of the Lepidoptera of Australia" by E.S. Nielsen, E.D. Edwards and T.V. Rangsi and "Biology of Australian Butterflies", edited by R.L. Kitching, R.E. Jones and N.E. Pierce.

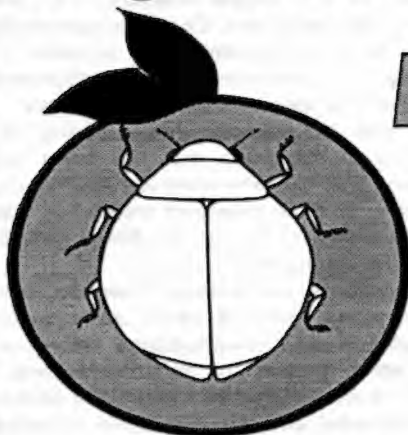
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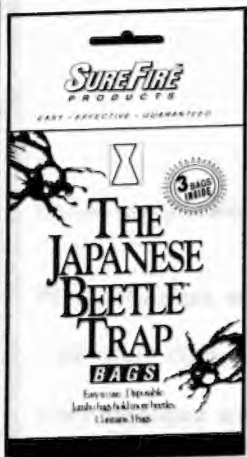
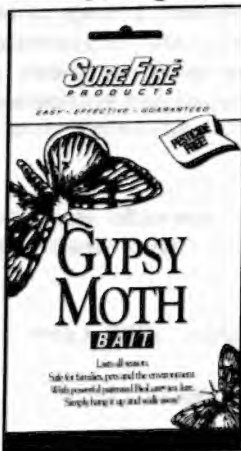
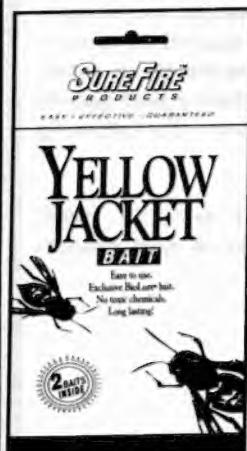
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AUSTRALIAN ACADEMY OF SCIENCE INTERNATIONAL EXCHANGE PROGRAM

The Australian Academy of Science coordinates a range of scientific exchanges for Australian scientists to visit other countries and for overseas scientists to work in Australia for short periods. Advertisements for these grants have been circulated to scientific institutions and societies and application forms and details can now be obtained from the Academy. The advertisements cover the following grants for scientific exchange in 1995:

- Bede Morris Fellowship Scheme for scientific visits to France in 1995, including the Rhône-Poulenc Fellow, Commonwealth Fellows and French Embassy Fellow.
- French Government Scientific Fellowships 1995, Level-1[†]
- Scientific Exchanges with the United Kingdom 1995
- Scientific Exchanges with Korea 1995
- Scientific Exchanges with Taiwan 1995
- Scientific Exchanges with China 1995-96
- Scientific Exchanges with Japan 1995-96
- Japan Society for the Promotion of Science Postdoctoral Fellowships in Japan 1995-96
- Science and Technology Agency Postdoctoral Fellowships in Japan 1995-96
- Japanese Government Research Awards for Foreign Specialists 1995-96

Further information and application forms for all these awards are available from International Exchanges, Australian Academy of Science, GPO Box 783, Canberra ACT 2601. Telephone enquiries: (06) 247 3966, Judith Hlubucek (9.30 am - 1.30 pm)

[†] *French Govt Fellowships - information and application forms from French Embassy, Scientific Section, French Govt Scientific Fellowships, 6 Perth Ave, Yarralumla ACT 2600. Telephone enquiries: (06) 270 5139, Jeanine Mordek.*

AUSTRALIAN ENTOMOLOGICAL SOCIETY INC.

INSECT ILLUSTRATION COMPETITION 1994

"A competition to encourage and recognise high standards of entomological illustration"

The Society invites unpublished entries to this competition which will be judged and displayed at the AGM and Scientific Conference to be held in Adelaide during 24-28 September 1994. The competition is open to members and non-members of the Society who are not employed or contracted as professional illustrators for fee or reward.

Entries, up to three per entrant, must be either black and white or coloured, whole body (dorsal or lateral views) taxonomic illustrations of insects or allied forms, such as shown in *The Insects of Australia*. The mounted illustrations should not exceed 21 x 30cm (approx. A4 size) and must be suitable for reproduction after reduction by 50%.

The Society shall have the right to display selected works in public and to reproduce the illustrations, with appropriate acknowledgment, on Society goods which it sells, and in magazines, for a fee.

Entries must be in the hands of the Convenor of the Annual General Meeting by **8 July 1994**. Postal entries must be carefully packed and include stamps or postal order sufficient to cover the cost of return postage, where necessary.

Categories:	Student section	- Colour
		- Black and white
	Open section	- Colour
		- Black and white

The Society will award \$150 for First Prize and \$50 for Second Prize in each of the four categories.

Each entry is to be accompanied by the following information:

- ② Name of entrant
- ② Postal address
- ② Current enrolment details (if a student)
- ② Category of entry/entries
- ② Scientific name of insect.

Forward the entry/entries and the above information to:

Dr A D Austin
Dept. of Crop Protection
Waite Campus, University of Adelaide
Glen Osmond SA 5064

NOTE: Closing date for entries is 8 July 1994

AUSTRALIAN ENTOMOLOGICAL SOCIETY INC. RESEARCH GRANTS 1994

Call for Applications

The Executive takes pleasure in calling for applications for the Australian Entomological Society Research Grants for 1994. The aim of the Grants is to encourage the advancement and spread of entomological knowledge, particularly in relation to Australian insects and allied forms. Grants may be submitted for such items as travel, equipment or technical support.

Total funds available will be in the order of \$3,000.

The Grants are primarily for small, short-term projects and will be available only to financial members of the Society of at least 12 months standing. Groups will be eligible provided that the primary researcher is a member.

A report to the Executive in a form suitable for publication in *Myrmecia* will be required by the end of 1995.

The applicant needs to provide the following details:

- ☐ Name
- ☐ Contact address and telephone number
- ☐ Aim and description of the project
- ☐ Expected duration of the project
- ☐ A detailed budget

The names of one or two referees may be provided if desired.

Applications may be for any amount up to \$1,000, but small, short-term projects which enable a diverse range of work to be funded may be favoured.

The President of the Society will appoint a Committee to allocate and administer the Grants. Successful applicants will be announced at the Society's Annual General Meeting on 26 September 1994.

Five copies of your application need to be submitted to the following address:

Dr Paul Madge
AES Honorary Secretary
c/o Dept. of Crop Protection
Waite Campus, University of Adelaide
Glen Osmond SA 5064

Note: Closing date for entries is 8 July 1994

AUSTRALIAN ENTOMOLOGICAL SOCIETY INC.

PHIL CARNE STUDENT PRIZE 1994

The Society's Phil Carne Student Prize for Scientific Writing is aimed at fostering high-quality entomological research in young scientists. The name of the prize celebrates contributions made by Dr Phil Carne to the science of entomology and to the Australian Entomological Society.

The prize is open to any student, enrolled full-time or part-time, who is an undergraduate or honours student who has not submitted their thesis prior to 8 July 1994. Entrants do not have to be members of the Australian Entomological Society.

Entries for the prize should be in the form of a scientific paper set out under the subheadings: Introduction, Materials and Methods, Results, Discussion, Acknowledgments, References. They should be 5,000 words or less in size (not including references, tables, figures or summary), should be in double-spaced typing and should be accompanied by a 100 word summary.

Three copies of entries need to be submitted to the Secretary of the Society by the **closing date of 8 July 1994.**

Entries are to be the sole work of the entrant, apart from the normally accepted input of an academic supervisor. Thus, entries should bear only the name of a single entrant.

Entries should not have been submitted to a scientific journal or other publication outlet prior to the closing date.

Each entry is to be accompanied by a completed Application Form (overleaf, a photocopy of the form may be used).

Entries will be judged by a committee of three people to be appointed by the President of the Society.

The winner will be invited to present the winning paper at the Society's 25th Annual General Meeting and Scientific Conference to be held in Adelaide during 24-28 September 1994.

The prize will be in the form of cash remuneration to the value of \$300 as well as providing free conference registration, accommodation and return airfare to the Society's Annual Conference (if the winning paper is presented at the Annual Conference).

THE AUSTRALIAN ENTOMOLOGICAL SOCIETY**PHIL CARNE PRIZE 1994****Application Form**

Please find attached my scientific paper for consideration for the 1994 Phil Carne Student Prize.

Name:

Postal Address:

Professional Qualifications:

Title of Entry:

Origin of Entry:

Degree Institute Part/Full Time ..

Name of First Supervisor

Endorsement by Head of Dept

(Signature)

I declare that this paper is my work and has not been submitted for publication elsewhere

Signed Date

Return completed form, with three (3) copies of your entry to:

Dr Paul Madge
AES Hon. Secretary
c/o Dept of Crop Protection
Waite Campus
University of Adelaide
Glen Osmond SA 5064

NOTE: CLOSING DATE FOR ENTRIES IS 8 JULY 1994

1994 Listing of Postgraduate Projects in Entomology AN AUSTRALIAN SURVEY

This is the first section of the list, which is now produced every two years instead of each year. There are 141 projects listed here, about half of the expected total. The rest will appear in the August issue of *Myrmecia*. Thanks to all those who contributed to the list (their names appear in the brackets before the entries) especially those who sent their entries on disk and saved me a lot of typing and reduced the error factor. If there is anyone who would be prepared to do the list every other year, I would be glad to hear from them and get back to an annual list. I received assistance in constructing the list from Patrick O'Rourke and Rowena Bower.

Jenny ANDERSON
CERIT, UNSW

NEW SOUTH WALES

University of New South Wales

(Dr. J.M.E Anderson)

School of Biological Science

- GOLETSOS, C. Bionomics and behaviour of Australian aphidophagous Coccinellidae. (PhD).
JACKSON, G. Response of ant community structure to ecosystem disturbance. (PhD).
LETNIC, M. The effect of fluoride pollution on ants from sand mined areas of Tomago. (B Sc Hons).
WILLIAMS, G. Pollination ecology in NSW rainforests (PhD).

Centre for entomological research and insecticide technology (CERIT)

- MCLEOD, L.J. Overwintering strategies and emergence patterns of *Lucilia cuprina* and *Chrysomya rufifacies* in the arid zone of NSW (PhD).

Macquarie University

School of Biological Sciences

(Associate Professor D.F. Hales)

- BLANCHE, K.R. Gall insect communities in relation to soil fertility (PhD).
CLAXTON, S. Taxonomy of Australian Tardigrada (PhD).
CRUSE, A. Antimicrobial mechanisms in termites (PhD).
HEINS, A.M. Degradation of organochlorine pesticides in soil by white rot fungi (PhD).
LEWIS, F. The biogeography and phylogenetic relationships of Oniscidea (Crustacea: Isopoda) in the South West Pacific (PhD).
MACKINTOSH, J. Inducible antimicrobial proteins

and polypeptides produced by Australian social insects (PhD).

- MILLER, J. Reproductive biology and life history of Australian Onychophora (MSc).
MONTGOMERY, M.E. Evaluating alternative genetic management procedures for endangered species using *Drosophila* (MSc).
MOULDS, M.S. A revision of the cicada genus *Abrieta* (MSc).
OLIVER, I. Rapid biodiversity assessment of arthropods in forestry management (PhD).
REID, A. Taxonomy of Australian Onychophora (PhD).
RODGERSON, L. Comparison of ant seed dispersal on infertile and fertile soils (PhD).
TERRAS, M.A. Biology and ecology of the red pepper mite, *Siteroptes mesembrinae*, with particular reference to mushroom cultivation (PhD).
WATSON, K. Effects of diet on ant colony demography (MSc).
WOODWORTH, L. Modelling conservation genetics problems using captive *Drosophila* populations (PhD).

University of Technology, Sydney

School of Biological and Biomedical Sciences

(Associate Professor P. Miller)

- WHILES, A. Comparison of efficacy of microencapsulated and non microencapsulated formulations of diazinon against cockroaches (Hons.)

University of Wollongong

Department of Biological Sciences

(Dr K. French)

- BEYNON, F. Effects of honey bees on the mating system of *Grevillea*. (PhD).
- CHRISTIE, F. Relationship between diversity of insects and birds in eucalypt woodland (Hons)
- GREGORY, M.P.M. Studies of the effects of urbanization on the stream invertebrates of the Illawarra escarpment. (PhD).

AUSTRALIAN CAPITAL TERRITORY

Australian National University

(Dr P.J. Gullan)

Division of Botany & Zoology, Faculty of Science
(* indicates cosupervision in CSIRO Division of Entomology; see also Taxonomy & General Biology Group, CSIRO Div. Ento.)

*CLAUDIANOS, C. The molecular evolution of the alpha-esterase cluster [with emphasis on Diptera] (PhD).

COOK, L.G. Karyology and evolution in *Apiomorpha* (Hemiptera: Eriococcidae) (PhD).

DAVIES, K. Insect ecology - topic to be decided (PhD).

*GLEESON, D. Genetic variation and insecticide resistance in the New Zealand sheep blowfly (PhD).

LOITERTON, S. The foraging behaviour of antlion larvae (Neuroptera: Myrmeleontidae) (Hons).

MELBOURNE, B. Insect ecology - topic to be decided (PhD).

*SALEU, L. Studies of *Tropilaelaps clareae* in Papua New Guinea (MSc).

Division of Biochemistry and Molecular Biology, Faculty of Science

(see entries under Division of Entomology, CSIRO, Biotechnology Group)

Molecular Evolution & Systematics Group, RSBS

HURST, M. Rapid and asymmetrical change in the structure of a narrow hybrid zone between two subspecies of *Caledia captiva* (Orthoptera: Acrididae): the roles of genetic and climate (Hons).

JONES, M. The cellular and molecular basis of limb morphogenesis in the locust, *Locusta migratoria* (PhD).

Molecular & Population Genetics Group, RSBS

BARTOSZEWSKI, S. Analysis of the regulation of

the expression of *sn*-glycerol-3-phosphate dehydrogenase locus in *Drosophila melanogaster* (PhD).

WILANOWSKI, T. Electrophoretic variation and regulation at the *sn*-glycerol-3-phosphate dehydrogenase locus in *Drosophila melanogaster* (PhD).

WU, Y. Molecular analysis of alcohol dehydrogenase in *Drosophila melanogaster* (PhD).

Visual Sciences Group, Research School of Biological Sciences (RSBS)

GIGER, A. Orientation analysis in honey bee vision (PhD).

Division of Entomology, CSIRO

Biological Control of Weeds Section

(with cosupervision in Botany & Zoology, ANU)

PETTIT, W. The impact of *Larinus* sp. (Coleoptera: Curculionidae) on *Onopordium* (Asteraceae: Cardueae) seed banks (Grad. Dip. Sci.)

Biotechnology Section

(Dr J.G. Oakeshott)

(with cosupervision in either *Biochemistry & Molecular Biology, *Botany & Zoology, or *RSBS, ANU)

*BAWDEN, A. Replication of the *Helicoverpa armigera* stunt virus (PhD).

BRIGGS, L. Evolution of individual exons in a cluster of alpha-esterase genes in *Drosophila melanogaster* (Hons).

*COATES, C. *Hobo*, *Hobo* - like elements and genetic transformation of the Australian sheep blowfly, *Lucilia cuprina* (PhD).

*COLEBATCH, G. Identification of proteins orally toxic to the green mirid (PhD).

*CRNOV, R. The molecular basis of entomopoxvirus infectivity (PhD).

*DAVEY, M. Isolation and characterisation of peptides acting on the gut of *Helicoverpa armigera* (PhD).

*DENT, S. Juvenile hormone esterase in *Drosophila melanogaster* (PhD).

*GARDENER, G. Characterisation of midgut endocrine peptides from the sheep blowfly *Lucilia cuprina* (Hons).

*GOODALL, S. Sex determination in the Australian sheep blowfly, *Lucilia cuprina* (PhD).

*JOHNSON, K. Antiviral defense mechanisms in

Drosophila melanogaster (PhD).

*LIAO, C. The toxicity of a *Bacillus thuringiensis* insecticidal crystal protein for *Helicoverpa armigera* (PhD).

*MORRISH, B. Evolution of function of *Esterase 6* in *Drosophila* (PhD).

*NEWCOMB, R. Molecular cloning of esterase genes involved in organophosphate insecticide resistance in *Lucilia cuprina* (PhD).

*ODGERS, W. Molecular basis of male specific expression of *Esterase 6* in *Drosophila melanogaster* (PhD).

*RICE, R. Molecular taxonomy of *Nosema apis* (PhD).

*ROBIN, G.C. Molecular analysis of an alpha-esterase gene cluster on chromosome 3R of *Drosophila melanogaster* (PhD).

*SMYTH, K-A. Molecular basis of malathion insecticide resistance in *Lucilia cuprina* (PhD).

*SUTHERLAND, T. Regulation of juvenile hormone synthesis in larvae of the sheep blowfly, *Lucilia cuprina* (PhD).

*VAN PAPENRECHT, E. The evolutionary genetics of *Esterase 6* in three sibling species of *Drosophila* (PhD).

*ZOLFAGHER, I. Induction of midgut proteases in response to protein feeding in adult female *Lucilia cuprina* (Grad. Dip. Sci.).

Pests of Crops and Timber Section

(with cosupervision in Botany & Zoology, ANU)

SCHUMACHER, R. A study of the parasitoids of larvae and eggs of the autumn gum moth, *Mnesampela privata* Guen. (Lepidoptera: Geometridae) on *Eucalyptus globulus* in Canberra (Grad. Dip. Sci.).

Stored Grain Research Section

(with cosupervision in Botany & Zoology, ANU)

ELEK, J.A. Chitin synthesis inhibitors in the control of stored product beetles (PhD).

Taxonomy & General Biology Section

(*with cosupervision in Botany & Zoology, ANU)

*BALDERSON, J.A. A systematic revision of the subfamily Paraoxyphilinae (Insecta: Mantodea) of Australia, with particular reference to the genus *Gyromantis* (PhD).

*BERRY, J.A. A revision of the Australasian Eunoetinae (Hymenoptera: Pteromalidae) (PhD).

*MILLER, L.R. Systematics of Nasutitermitinae (Isoptera) (PhD).

*STRONG, K.L. The phylogeny of laelapid mites associated with arthropods (PhD).

OTTO, J. Systematics and biology of Australian Erythracarinae (Acari: Prostigmata: Anystidae) (PhD through Bremen Uni., Germany)

VICTORIA

LA Trobe University, Bundoora campus

(Associate Professor T. New)

School of Zoology

CAMERON, A. An ecological study of the Kerang Wetlands (MSc)

EDWARDS, M. Control of insects in citrus and grapevines using entomophagous fungi and nematodes (PhD)

ENDANG SRI KENTJONOWATI Taxonomic and zoogeographical study of psocidae (Psocoptera) in Java and eastern islands of Indonesia (MSc)

HOCHULI, D. Feeding biology of the armyworm (PhD)

MANSFIELD, C. Host-finding by insect pests and beneficials (MSc)

SCHMIDT, E.R. The systematics and biogeography of the Psocoptera of Tasmania with special reference to the Elipsocidae (PhD)

SILBERBAUER, L.X. Comparative social behaviour in native allodapine bees (PhD)

SPESSA, A.C. Evaluation of resource competition between introduced and native bees (PhD)

SYMINGTON, C. Effects of pesticides on biological control agents (MSc)

TRAICEVSKI, V. Nutritional ecology of the cowpea aphid (PhD)

WALKER, K. The systematics and biogeography of the Australian native bee subgenus *Lasioglossum* (Chilalictus) (Hymenoptera: Halictidae) (just submitted for PhD)

WANG, Q. Systematics biogeography and ecology of the Australian phoracanthine borers (Coleoptera: Cerambycidae) (just submitted for PhD)

School of Genetics and Human Variation

BJORKSTEN, T. Experience and host response in *Trichogramma* (PhD)

CLANCY, D. Cytoplasmic incompatibility in *Drosophila* (PhD)

GLENN, D. Selecting *Trichogramma* for controlling Light Brown Apple Moths (PhD)

JENKINS, N. Genetics of *Drosophila serrata*

species borders (MSc)

JERMIIN, L. Evolutionary patterns in ants as determined from mitochondrial DNA sequences (just submitted for PhD)

KOULIANOS, S. Mitochondrial DNA variation in Australian strains of honeybees (just submitted for PhD)

KOVACS, I. Variation in pre-reproductive period and migration in *Helicoverpa punctigera* (MSc)

LOWE, R. Sociobiological and evolutionary studies on anthophorid bees (MSc)

MERTON, E. Establishment pests of canola (MSc)

SGRO, C. Genetics of life history variation in *Drosophila* (PhD)

TAY, W.T. Mitochondrial and nuclear DNA variation in *Rhytidoponera* ant populations (MSc)

WATSON, M. Cold resistance and acclimation in *Drosophila* (MSc)

WOODS, R. Asymmetry and adaptation to captive conditions in *Drosophila* and mice (MSc)

University of Melbourne

Department of Genetics

(Dr J. Martin)

ANDREWS, J.R The genetics of the *Suppressor of stoned* locus in *Drosophila* (PhD).

BOURKE, S. The genetic basis of resistance to diazinon in *Lucilia cuprina* (BSc hons).

BROWN, M. *Drosophila* as a model system to investigate amyloidogenesis (PhD).

CHEN, Z. Z. Molecular and cytological studies in Dipteran insects (PhD).

DABORN, P. Cyromazine resistance in *Drosophila melanogaster* (BSc hons).

ELLIOTT, D. Molecular variation at the *Scalloped wings* locus of *Lucilia cuprina* (BSc hons).

MERAKOVSKY, J. Neurological genes and protein phosphorylation in *Drosophila* (PhD).

PRICE, G. A genetic study of *Drosophila* calcium-binding proteins (BSc hons).

PYKE, F. Evolution of resistance to diazinon in *Drosophila melanogaster* and *Lucilia cuprina* (MSc).

SMITH, M. A study of the *stoned* locus in *Drosophila* (BSc hons).

UREN, A. Characterisation of a gene encoding a novel calmodulin binding protein (BSc hons).

WARR, C. Characterisation of genes encoding calmodulin binding proteins in *Drosophila melanogaster* (PhD).

TASMANIA

University of Tasmania

Cooperative Research Centre for Temperate Hardwood Forestry

(Dr Anthony Clarke)

DUNGEY, H. Susceptibility of *Eucalyptus* hybrids to herbivores (PhD)

HOWLETT, B. Host plant location by *Chrysophtharta bimaculata* (Olivier) (Col.: Chrysomelidae) (PhD)

HUNT, A. The feeding ecology of *Chrysophtharta bimaculata* (Olivier) (Col.: Chrysomelidae) egg and larval predators (Col.: Coccinellidae) (PhD)

PATTERSON, K. Host plant factors affecting oviposition and larval survival of *Chrysophtharta bimaculata* (Olivier) (Col.: Chrysomelidae) (PhD)

STEINBAUER, M. The ecology and host plant relationships of Tasmanian Coreidae (Hemiptera) (PhD)

QUEENSLAND

University of Central Queensland

(Dr R Newby)

GARRETT, A. Pollination biology of papaw, (*C. papaya*) in the sub - tropics. (PhD)

FARRELL, P. Parasitism in the potato moth (*Phthorimaea operculella*) (Lepidoptera: Gelechiidae) a pest of tomatoes in Central Queensland and the developmental biology of one of its parasitoids *Copidosoma desantisi* (Hymenoptera: Encyrtidae). (MSc)

LEECH, P. Biology of false spider mite (*D. floridanus*); a pest of pineapples in Central Queensland. (MSc)

RAYNER, D. Species diversity and community structure of spiders in tropical mango orchards. (MSc)

CATESBY, A. The aetiology of papaw dieback: an insect transmitted mycoplasma? (Hons)

COMRY, T. Soil and litter fauna in revegetated mine site communities. (Hons)

SOUTH AUSTRALIA

The University of Adelaide

Waite Agricultural Research Institute

Department of Crop Protection

(Dr A. Austin, Catherine Hill)

ASGARI, S. Molecular entomology and insect immunity. (PhD)

DANGERFIELD, P. Systematics and phylogeny of the genera of Cardiochilinae wasps (Hymenoptera: Braconidae) with a revision of the Australasian species. (PhD).

FIELD, S. Host selection behaviour, ovipositor morphology and host relationships in Scelionid egg parasitoids (Insecta: Hymenoptera). (PhD)

FOULIS, S. The effects of host and non-host chemicals on the ovipositional behaviour of the lucerne seed wasp *Bruchaphagus roddi* (Guss). (Hons.)

FROST, W. The population ecology and distribution of cereal rust mite *Abacarus hystrix* Nalepa in southern Australian ryegrass pastures. (PhD)

HATAMI, B. Biological control of diamondback moth *Plutella xylostella* (L.) using parasitoid wasp *Diadegma semiclausum* Hellen. (PhD).

HERMINANTO, H. Use of mass releases of parasitic wasps to control the diamondback moth *Plutella xylostella*. (PhD)

HILL, C. The mode of action of *Bacillus thuringiensis* against the sheep louse, *Bovicola ovis* (PhD)

IQBAL, M. Systematics and biology of Baeini (Hymenoptera: Scelionidae) (PhD)

JENNINGS, J. The systematics and biogeography of the Australian Hyptiogastrine wasps (Hymenoptera: Gasteruptionidae). (M.Ag.Sc.).

JOHNSON, L. The influence of host factors on the efficiency of searching behaviour of the parasitic wasps *Apanteles ippeus* and *Cotesia plutellae*. (PhD)

KINUTHIA, W. Immune evasion of eggs and larvae in an insect endoparasitoid host interaction (PhD)

KITT, J. The introduction, establishment and ecology of the parasitic wasp *Aphidius rosae* Haliday (Hymenoptera: Braconidae) into Australia for biological control of rose aphid in Australia. (PhD)

LORRAINE, D. Oxidation of allelochemicals by sucking insects (PhD)

MADDEN, C. The use of morphological deformities in chironomid larvae as an indicator of pesticide and heavy metal pollution in water catchment

areas of South Australia (PhD)

SAEED, A. Systematics and phylogeny of the genus *Diologaster* Ash (Hymenoptera: Braconidae) with a revision of Australasian species (PhD).

SOLEYEMAN-NEZHADIAN, E. The ecology of two common species of hover flies *Simosyrphus grandicornis* and *Melangyna viridiceps* (Diptera: Syrphidae) and their impact on the population of green peach aphid on potato. (PhD)

TALAEI, R. Consequences of variation of the life history traits on fitness of braconid wasps (PhD)

TAYLOR, G. Etiology of the lesions caused by coreids and some comparisons with similar lesions of other hemipterous insects. (M. Ag. Sc.)

WELLBY, C. Characterisation of an insect protein involved in immune evasion. (Hons)

Department of Zoology

WALLMAN, J. The taxonomy and biology of carrion breeding Calliphoridae in South Australia (PhD)

WESTERN AUSTRALIA

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School of Environmental Biology

DAY, C. The litter invertebrate fauna of paddocks replanted and native vegetation in the Western Australian wheatbelt. (Hons).

BRANDENBURG, S.A. Impact of revegetation on ecosystem processes: Decomposition in revegetated areas in the Western Australian wheatbelt. (PhD).

HOULDING, B.J. Integrated pest management in Western Australian strawberry crops (MSc)

SZITO, A. Revision of the Australian genus *Trogoderma* (Berthold) (Coleoptera: Dermestidae: Anthrenini) (M.Sc)

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